Issue 8: November 2014

India
Adapting livelihoods to climate change
In this issue

This edition of the newsletter focuses on how projects supported by IFAD are helping rural people adapt to climate change. This can involve making better use of available rainfall through the conservation and storage of water and its use for irrigation - as illustrated by stories from Maharashtra, Madhya Pradesh (MP), Rajasthan and Assam. Farmers have long grown crops such as millet that are resilient to drought, and we have a story from MP on how farmers are being helped to increase the yield of millet and sell the crop for premium prices. Insurance is another approach to dealing with the unexpected, and in Tamil Nadu women's self-help groups are involved in facilitating insurance policies for coastal communities vulnerable to extreme weather events.

The newsletter also describes how a project used a range of knowledge management (KM) activities in support of development initiatives. Although not directly related to climate change, it shows how a project can use KM to increase its effectiveness and outreach. We also have two stories on alternative energy (biogas and solar lighting), which show how rural communities can contribute to climate change mitigation while also reaping direct environmental benefits from reduced indoor pollution and cutting of trees for firewood.

This newsletter introduces a "grants corner" with five stories from small projects funded by grants from IFAD, which are being implemented through partnerships with three different International Agricultural Research Institutes in a number of countries including India. These stories also have a climate change theme and include upland rice, flood and salt resilient paddy, and better ways of growing drought tolerant pulses and millet, as well as dairy farming and goat production. In future we hope to continue sharing stories from IFAD’s grant partners to help create better synergies between loan and grant projects.

Latest News

IFAD President visits India
Meets Union Ministers and discusses ongoing partnerships in support of sustainable agriculture and women’s empowerment

The President of IFAD, Kanayo F. Nwanze, visited India from 4 to 9 August, along with the Director of IFAD’s Asia and Pacific Region, Ms Hoonae Kim, to meet various Union Ministers, including the Hon’ble Minister of Finance, Mr. Arun Jaitly, the Hon’ble Rural Development Minister, Mr. Nitin Gadkarl, and the Hon’ble Women and Child Development Minister, Mrs Maneka Gandhi, to discuss how rural transformation and gender empowerment are vital to sustainably reduce poverty and drive inclusive growth. While in New Delhi the President also met with key development partners including the UN Country Team. On 5 August, President Nwanze delivered the Foundation Day lecture of the Trust for Advancement of Agricultural Sciences
At the Global Investors’ Summit (GIS) held in Indore from 8 to 10 October, women from the IFAD-supported Tejaswini Rural Women Empowerment Project in Madhya Pradesh (MP) shared their experiences on self-development, empowerment and livelihood improvement. The GIS is a bi-annual event organised by the government of MP and this year was inaugurated by Hon’ble Prime Minister, Mr Narendra Modi. The country’s top industrialists participated, along with entrepreneurs from many different sectors.

The GIS included a seminar on Women Entrepreneurs. This was attended by the Hon’ble Finance Minister of MP, Mr Jayant Malaiya; the Principal Secretary of the Women and Child Development Department, Mr J.N. Kansotia; the Commissioner for Women’s Empowerment and Child Development, Ms Kalpana Shrivastava; Managers of the Tejaswini Programme; and women entrepreneurs from the various states of India.

At this seminar Ms Kalpana spoke about development process for woman entrepreneurs, the problems and challenges they face, and how these could be overcome. Ms Vinita Namedev, the President and Ms Rekha Pradam, a member, of the Tejaswini Nari Chetana Mahila Sangh, a federation of Self-Help Groups in Dindori district also addressed the seminar. This federation has been assisted by the Tejaswini Project. The seminar heard how the federation had grown to become a large group of nearly 2,500 women members. The federation has enabled tribal women living in remote pockets of Dindori district make good profits by cultivating millet using modern farming techniques, and this year the federation is assisting nearly 6,000 rural women in the farming of millet (see story on page 4). The seminar participants appreciated the hard work, dedication and confidence of these tribal women.

**IFAD reviews and supports India portfolio**

In addition to the events described above, between May and October 2014, IFAD staff and consultants, along with project staff, participated in the following missions:

- Project Design Mission (appraisal) for the Odisha Tribal Empowerment and Livelihood Improvement Project
- Supervision Mission for the Tejaswini Rural Women’s Empowerment Project – Madhya Pradesh
- Supervision Mission for the Odisha Tribal Empowerment and Livelihoods Project
- Supervision Mission for the Post Tsunami Sustainable Livelihoods Project - Tamil Nadu
- Supervision Mission for the Mitigating Poverty in Western Rajasthan project
- Implementation Support Mission for the Odisha Tribal Empowerment and Livelihoods Project
- Implementation Support Mission for the Women’s Empowerment and Livelihoods Programme in the Mid Gangetic Plains
- Implementation Support Mission for the Tejaswini Rural Women’s Empowerment Project – Maharashtra
- Implementation Support Mission for the Jharkhand Tribal Empowerment and Livelihood Project

**Adapting to climate change**

**Rainwater harvesting leads to bigger harvests for farmers in Maharashtra**

Farmers in the Vidarbha region of Maharashtra primarily rely on rainfall to grow their crops. However the region is notorious for its unreliable rainfall and farmers often face loss of their crops - although in 2013 excessive rainfall rather than drought was the problem. A project supported by IFAD and the Sir Ratan Tata Trust, Convergence of Agricultural Interventions in Maharashtra (CAIM) aims to build the resilience of small farmers in this region. One of the main strategies for resilience is

![De-silted weir across a nulla in Chandpur Railway cluster, Amravati District](image-url)
soil and water conservation (SWC) works that aim to increase the infiltration of rainwater into the ground as well as reducing soil erosion. Physical SWC works include building of bunds along contour lines, small check dams, de-silting and training of nullas (seasonal watercourses), and small farm ponds to store water for irrigation.

Feedback from farmers regarding the benefits of SWC works have been collected via a series of Annual Outcome Surveys (AOS), each covering a random sample of 200 CAIM households and 200 control households from non-project villages. Surveys over the last three years show that there has been a marked increase in the number of CAIM households reporting benefits from soil and water conservation, with the proportion of the project sample increasing from 4% in 2011/12, to 10% in 2012/13 and 31% in 2013/14. This compares with an increase from 4% to 10% for the control group.

**Table 1: Benefit from soil & water conservation**

<table>
<thead>
<tr>
<th></th>
<th>AOS 2011/12</th>
<th>AOS 2012/13</th>
<th>AOS 2013/14</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project</td>
<td>Control</td>
<td>Project</td>
</tr>
<tr>
<td>Proportion of sample households report benefiting from SWC</td>
<td>4%</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>n (sample size)</td>
<td>162</td>
<td>180</td>
<td>200</td>
</tr>
</tbody>
</table>

In the 2012-13 AOS most households (both project and control) who reported benefits said SWC has resulted in an increase in the water table (see Table 2). This means people have more water in their wells for both irrigation and domestic use. Over half of the project group also reported prevention of soil erosion and an increase in crop yields - many more than for the control group, suggesting that CAIM SWC works may have been more effective than those done by other programmes.

**Table 2: Type of benefit from soil and water conservation (2013/14 AOS)**

<table>
<thead>
<tr>
<th></th>
<th>Project</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
</tr>
<tr>
<td>Got some benefit</td>
<td>56</td>
<td>28%</td>
</tr>
<tr>
<td>Type of benefit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irrigation</td>
<td>17</td>
<td>30%</td>
</tr>
<tr>
<td>Wages paid for SWC labour</td>
<td>6</td>
<td>11%</td>
</tr>
<tr>
<td>Increase in water table</td>
<td>49</td>
<td>88%</td>
</tr>
<tr>
<td>Prevention of soil erosion</td>
<td>32</td>
<td>57%</td>
</tr>
<tr>
<td>Better drainage</td>
<td>16</td>
<td>29%</td>
</tr>
<tr>
<td>Increase in yield</td>
<td>28</td>
<td>52%</td>
</tr>
</tbody>
</table>

Case studies illustrate how farm ponds and nulla improvement have resulted in substantial benefits.

**A farm pond makes a big difference to Sitaram’s life**

Sitaramji Shamrao Masram and his family of five used to survive on a total income of no more than Rs5,000 per month, mostly coming from casual work in the fields of other farmers, and some meagre earnings from their 3 acres of land. However his crops relied entirely on rainfall, which is uncertain and irregular in the Vidarbha region of Maharashtra state.

Sitaramji met the team from KJBF when they visited Mangli village in Samudrapur cluster to meet the community to plan the implementation of CAIM. At this meeting he suggested the construction of a farm pond on his land. This was agreed, and CAIM constructed, using a mechanical digger, a pond of 20 metres x 2 metres and 3 metres deep and able to store 920 m$^3$ of water. Sitaramji has used the water to cultivate vegetables. In his first summer season he grew okra, beans, chilli, and brinjal on 2 acres, making a total income from sales of vegetables of Rs98,000. His total expenses were Rs15,000, including his own labour, seed, fertilizer, pesticides, diesel for pumping, transport and other expenses. Now Sitaramji is sowing this land again with vegetables and is also growing cotton on his other one acre of land.

Following the harvest of these crops he set up a bicycle repair shop with a grant of Rs10,000 from KJBF, from which earns Rs50 to Rs100 per day – a steady income which is not dependent on the risks and vagaries of farming. Sitaramji and his family now earn Rs12,000 to Rs15,000 per month from farming and bicycle repairing. He no longer needs to work on the land of other farmers, which has increased his status in the village.
Nulla improvement works in Seeloo cluster

CAIM is working in 62 village clusters in six districts with a contracted Implementing Agency (IA) responsible for the activities in each cluster. In the Seeloo cluster of Wardha district, the IA is Kamalnayan Jamnail Bajaj Foundation (KJBF), an NGO linked to one of India’s major industrial groups.

At the start of the programme, discussions with farmers identified the following major water-related constraints to crop production:

- Erratic and inconsistent rainfall, with long dry spells even during the monsoon season.
- Despite limited water, farmers mostly grow crops of long duration with high water requirement such as cotton and soya-bean.
- Lack of perennial water sources to allow irrigation, so farmers could only grow a single crop during the monsoon season.
- The water table becomes seasonally depleted, making it difficult to use wells for irrigation and there are shortages of water for domestic use.
- Heavy rainfall during the monsoon causes erosion and loss of the uppermost fertile layer of soil.
- Subsequent water-logging and lack of drainage significantly lowered the agricultural productivity.

To address these issues, KJBF suggested investment in the widening and deepening of existing nullas, along with check dams across the nullas. One location for these interventions was a nulla running from Borkhedi Kala to Antargaon village. This had a total length of 6.61 km, and the first phase of work was to improve the downstream 3.01 km stretch passing through Antargaon village. There were already three Government check dams, and KJBF constructed two more, along with comprehensive desilting and remodelling of the nulla. These works resulted in:

- Direct benefits to 102 farmers by reducing water logging and flood damage to 428 acres of land.
- More water in around 50 wells, with the water table increasing by an average of 1.2 metres.
- The availability of water has led to farmers growing a greater range of crops. Initially 30 farmers started to grow groundnuts, 16 planted guar gum, 15 cultivated chilli, four vegetables, three cucumber, and two grew papaya. Within two years the area under groundnut had grown to 300 acres.
- Farmers, individually and as groups, invested in 15 pumps to lift water which is now retained behind the check dams. KJBF assisted the farmers to purchase the pumps and also to obtain drip and sprinkler equipment to make more efficient use of the available water. Nearly all farmers now use sprinkler irrigation, and three now have drip systems, with another 25 farmers planning to install drip irrigation.

Supplementary irrigation of cotton has prolonged the picking season, increasing the yield from 400 to 500 kg per acre to 700 to 800 kg per acre, resulting in additional income of Rs16,000 per acre, while an additional 100 kg/acre of soybean has increased income by Rs3,000 per acre. In this village the programme has also funded construction of five farm ponds and two wells. Each well serves at least 5 farmers (who contributed half of the cost), covering a minimum area of 27 acres.

Millet - a climate-change resilient crop

Millet is a hardy small-seeded grass that can be grown under marginal conditions of soil fertility and moisture and so are used as rainfed-crops in dry zones. Their short growing season (as little as 65 days) means they only need a short period of rainfall. Millets are also highly nutritious. However, unlike the more popular cereals, such as wheat, maize and rice, millets have largely been overlooked by plant breeders and other agricultural development initiatives.

farmers from Dindori district are now finding new ways of growing and marketing kodo and kutki, that increase yields and make production an economically attractive option.

The initiative to develop millet production is being implemented via a federation of women’s Self Help Groups (SHGs), Nari Chetna Mahila Sangh Mehendwani, with the objective of enhancing the production of millets and increasing the income of farmers by marketing this crop at a higher price in comparison to wheat and paddy. This initiative is a part of the IFAD supported Tejaswini Rural Women’s Empowerment Programme.

Although the community had experience in producing kodo and kutki millet, lack of technical knowhow and poor access to markets meant that yields and sale prices were low. Farmers only produced about 100 kg from an area of 0.5 to 1.0 acres, and any surplus was sold at a price of only Rs8 to Rs10 per kg - giving a very low total crop value in the region of Rs1,000 to Rs1,500 per acre.

The initiative to develop millet is based around a package of improved practices promoted by an Agricultural University in Jabalpur, the Jawaharlal Nehru Krishi Vishwa Vidhyalaya (JNKVV), and its associated agricultural research and outreach

Nulla revival in Antargaon village

Pumps extracting water for irrigation

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Farmers in southern Madhya Pradesh have long grown two types of millet crops, kodo and kutki(little millet). However, the low yield of local varieties grown using traditional practices means that farmers are increasingly switching to wheat and rice, despite the vulnerability of these crops to climate change. But farmers from Dindori district are now finding new ways of growing and marketing kodo and kutki, that increase yields and make production an economically attractive option.

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station (Krishi Vigyan Kendra - KVK) in Dindori. The programme begun by training 1,497 women farmers (SHG members) on millet production technology involving experts from the KVK and JNKVV, as well as the staff of Tejaswini Facilitating NGOs such as NYWCID, and also locally based project staff. People from the villages involved were selected as Community Resource Persons (CRP) and given additional training along with exposure visits to the KVK at Dindori. Under the technical guidance of KVK staff, improved varieties of Kodo (JK–48 and JK–439) and Kutki (JK–8) were selected and seed provided to farmers. Farmers were encouraged to use the techniques of Integrated Nutrient Management (including the use of vermicompost) and Integrated Pest Management involving the use of neem oil to control insect pests.

These interventions have increased the yield of millet by a factor of two or three, with farmers producing between 100 kg and 150 kg from an area of 0.5 acre instead of 100 kg from 1 acre. The SHG Federation has also built links to higher value markets which have enabled farmers to capitalise of the reputation of Dindori district for high quality millet with special health benefits. The Department of Agriculture provided the Federation with a machine to clean and grade millet grains. As a result of these improvements farmers now sell millet through the Federation for Rs40 per kg - four times more than they got earlier. Combined with higher yields, the value of millet produced from 0.5 acres of land is now Rs4,000 to Rs4,500, compared with only Rs1,000 to Rs1,500 from one acre previously.

In total the 1,497 women farmers produced 224.5 tons of millet from 748.5 acres, worth a total of Rs8898 million. After deducting input costs, each of these farmers made about Rs5,200. In addition each farmer deposited 20 kg of millet for seed with the Federation which now has a total 30 tons of seeds available to distribute to other farmers. From July 2014 the Federation plans to expand the initiative to 2,700 women from SHGs plus another 3,800 other farmers.

The idea of the check dam made of bags is not really new, but in Tejaswini villages construction has been led by women and managed through VLCs on a completely voluntary basis. This has enabled rapid dissemination without the need for external support, with the knowledge of constructing and managing a structure of this kind remaining and growing within the community. As one villager said “It is really an appreciable act of women power. It is undoubtedly the fruitful outcome of self confidence, awareness and firm determination of women, which proves that women have now understood their importance and role in society”.

Author: Seema Raghuvanshi, Knowledge Management Specialist, Tejaswini Rural Women’s Empowerment Programme, Madhya Pradesh.

Communities take the initiative to conserve water

Communities in Dindori district of southern Madhya Pradesh are taking action to conserve water and so ensure that they have water for domestic and livestock use during the dry season and to enable some crops to be irrigated. This helps secure their livelihoods in an area of increasingly uncertain and variable rainfall.

This initiative started in Dindori district with the formation of Village Level Committees (VLC) as part of the Tejaswini Rural Women’s Empowerment Programme being implemented in the State by the Women’s Development Corporation with support from IFAD. VLCs are formed from representatives of women’s Self Help Groups from the village in order to address issues relating to livelihoods, local governance and resource management.

The first of these dams was built in Ravankund village where the Tejaswini Facilitating NGO, DSS, encouraged women SHG members to come together through their VLC to plan and build a small check dam across a nulla (seasonal watercourse). The men in the village were not interested at first, but watching the women work, they slowly joined in. The structure was built entirely with voluntary labour using discarded woven polypropylene bags filled with earth (the bags were previously used for fertiliser, cement, grain etc.). With people offering their time for a few hours every day, a check dam can be completed in about two weeks. These dams are called bori bandhaan (bag dams) and have the advantage that the structure is not permanent, but can be modified, taken down or built up with ease by simply moving a few bags of soil here and there.

These dams retain rainwater, so rather than a nulla drying up in December, it may hold water until March or even May. This provides a source of irrigation water and also increases infiltration of water into the aquifer, meaning that wells produce water for a longer period during the dry season. Bori bandhaans are a major step forward for villages that were previously totally dependent on rainfall. Irrigation has enabled women to cultivate kitchen gardens producing vegetables for home consumption and sale.

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The benefits of water conservation and the ease of building bori bandhaan has helped the idea to quickly spread to other areas of the Tejaswini programme, including 24 villages within the Shahpura location itself. Women from other locations have also begun replicating the idea in their villages. There could easily be 55 of these structures in the district now.
The magic of minor irrigation

From subsistence farming to surplus food in Assam

Hereilo village is a remote village in Assam state, located about 130 km from Haflong, the district headquarters of Dima Hasao district. The village consists of 45 households of the Zeme Naga community. Livelihoods rely on shifting cultivation (jhum) and collection of non-timber forest products (NTFP), and villagers also work for wages as casual labourers.

Although the village is rich in land and water resources, farmers do not produce enough paddy, and food security is a problem. The remote location, poor roads and lack of transportation meant that the marketing of any cash crops and NTFP was a challenge, with the nearest market (Laisong Bazaar) 30 km away on a road which is practically non-motorable during the monsoon season. Moreover, there is only one public transport vehicle, which mainly only plies on the weekly market days, and the hiring of private vehicles is unaffordable. The village has also been affected by insurgency, which has limited development activities in the area.

Winds of change bought hope to the community when they came into contact with IFAD-supported North Eastern Region Community Resource Management Project for Upland Areas (NERCORMP) in 2010. The project partner NGO, BAUS, along with NERCORMP district staff held many meetings in the village and motivated them to set up a NaRMG (Natural Resource Management Group), which then helped to draw up a Community Resource Management Plan. The village gave enthusiastic cooperation and took full ownership of the activity.

The first work planned was to develop a minor irrigation (MI) system along with the terracing of fields for wet-land rice cultivation. A technical survey involving the NaRMG, project staff and partner NGO concluded that construction of about 2 km of canal could immediately benefit 15 households with an average of 0.5 to 0.7 ha of terraced field for rice and other crops. The project initially provided Rs420,000 and within about four months, the village constructed 2 km of canal - one km concrete and one km earthen. Most labour and local material was provided by the community. This has enabled the 15 households to grow wet-land paddy. In 2013 they reported that their paddy production was between 1,750 kg and 2,400 kg per household compared with around 600-650 kg that they got from upland jhum paddy in 2010. With this increase in production these households now have surplus food grain for sale to other households in the village. In addition they have started to grow leguminous crops after paddy has been cultivated, thereby earning additional income.

The project has also promoted local high yielding varieties of rice and has introduced some new varieties, locally known as 'lajong'. The aim in promoting traditional and local high yielding varieties is to build resilience to the impacts of climate change.

The 15 households receiving irrigation have formed a Minor Irrigation Activity Group to manage the sharing of water and undertake maintenance of the irrigation canal, besides sharing of paddy seeds and exchange of knowledge on agronomic practices for their crops. There is plan to further increase area of irrigated terraced fields and cover more households.

With facilitation from the project and the partner NGO, Hereilo NaRMG has demarcated water catchment areas and protected these areas by framing rules and regulations. This will help to ensure that the irrigation water resources are managed in a sustainable way.

A significant change can be seen in the lives of people in Hereilo village. The NaRMG has a revolving fund to undertake economic livelihood activities as per their choice and priority. The women of the village have been organised into SHGs. The SHGs use money from their monthly savings and from the revolving fund for income generating activities. Improved home gardens and livestock rearing are contributing to better diets and nutritional security.
New crops and farming methods transform livelihoods in southern Rajasthan

Deoli and her husband Monar used to scrape a precarious living, largely by cutting firewood and carrying it 15 km to a town in Gujarat for sale. This would only earn each of them Rs30 per day, and was also gradually destroying the local forests. Although the family had 0.9 acres of land, this area is hilly with rocky outcrops and thin soils, and only 0.57 acres was cultivable. A single crop of maize only provided enough food grain (in a year of good rainfall) to support the family of six for two months. Now, with support from a project, they are able to earn a good income from farming.

This improvement has come about through a combination of improved methods of food crop production and vegetable production on a commercial scale, supported by the development of irrigation, micro-finance services and animal health care. This all started three years ago when Deoli joined a women’s SHG being established by PRADAN, an NGO which is the local field implementation partner of the Mitigating Poverty in Western Rajasthan (MPOWER) project being implemented by the Department of Rural Development of the Government of Rajasthan with support from IFAD and the Sir Ratan Tata Trust.

As a member of the SHG, Deoli made regular savings and took loans which helped pay for education and health expenses. Then last year, she got training in agriculture and started to grow vegetables, earning Rs35,000 (less about Rs4,000 for input costs) from 12 decimals of tomato, chilli and brinjal. This year she is also growing 12 decimals of vegetables, but has planted more marigolds in the crop to help control insect pests. Another improvement this year is better staking for tomatoes, with stronger posts and the use of polymire wire - which is both longer lasting and cheaper than steel wire.

Deoli and 12 other farmers have benefited from a lift irrigation scheme installed with help from MPOWER two years ago. A diesel pump lifts water from a small river to irrigate, via a network of buried pipes, 10.8 acres of land. Farmers pay for their own fuel plus a 10% maintenance charge per irrigation, which has enabled a maintenance fund of Rs10,000 to be accumulated. Water in the river has become perennial (except in a very dry year) since the government built a series of concrete check dams. Irrigation has enabled the 13 farmers to provide protective irrigation for maize, and to grow a total of 2.5 acres of vegetables as well as irrigated wheat and mustard.

Deoli gave her maize one irrigation last year, which, along with seed treatment and the application of basal fertiliser as well as top-dressing with urea, produced 200 kg from an area of 45 decimals. Previously they only got 100 to 150 kg of grain from all their 57 decimals. In the current season Deoli hopes that yields will be even higher as she has sown the crop in lines for the first time and did a better job of seed treatment.

With irrigation they have started to grow wheat and mustard. The wheat crop produced 300 kg from 20 decimals of land, and mustard 50 kg from 10 to 15 decimals. Overall food grain production from their own land has increased from 100-150 kg (for 2 months) to 500 kg (enough for 6 months). With better health care the number of goats the family owns has increased from 6 to 10.

As an SHG member for 3 years, saving Rs10 per week, Deoli has accumulated Rs1,430 in savings, and has taken 4 or 5 loans of between Rs500 to Rs15,000. The loan of Rs15,000 was used to redeem ornaments from a moneylender. Other loans are used for education, health and farm inputs. The family are now able to spend more on food and education (three of their four children are at school). Deoli says that in future she would like to develop some of the land that is not now cultivated to increase the area for crops and vegetables.

These interventions have transformed the livelihoods of many families in the area around Deri village, and agriculture has replaced the cutting and sale of firewood as the main source of income. Deoli, as the project’s Krishi Sakhi (agricultural guide) has played a key role in this - advising farmers and helping to organise development activities in the village.

Insurance reduces risk for coastal communities

Insurance is another approach to reducing risk in the more uncertain weather conditions brought about by climate change. This approach is being taken up by vulnerable coastal communities in Tamil Nadu with support from the Post Tsunami Sustainable Livelihoods Programme. This initiative is being implemented by the State Government’s Rural Development & Panchayat Raj Department with financing from IFAD. Insurance is being provided to the households of members of women’s SHGs set up by the programme through Panchayat Level Federations (PLF) of these SHGs. These PLF act as agents for partner insurance companies and are responsible for...
both selling insurance policies and supporting claims made by policy holders.

The 2013 Annual Outcome Survey showed that almost half of SHG members had insured assets - primarily houses - and quite a number had made claims to repair damage after cyclones and storms had hit the coast. Successful claims have encouraged other households to take out insurance policies. Insurance for health and personal accident are even more popular than asset insurance.

<table>
<thead>
<tr>
<th>Type of policy</th>
<th>Percentage of sample* households with policies</th>
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<tr>
<td></td>
<td>Project households</td>
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<tr>
<td>Asset</td>
<td>49</td>
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<td>Savings linked life</td>
<td>29</td>
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A success story of biogas

An NGO, Kamalnayan Jannalal Bajaj Foundation (KJBF), has been supporting the development of biogas in villages of Wardha District of Maharashtra. A team from KJBF visited Ralegaon village, Samudrapur block, to find out about the results of this programme. As the team reached the village, they found a well maintained biogas plant at the home of Mr Mangesh Baliramji Umredkar. His wife, Sangita, welcomed the team and told them how happy she was to have a biogas unit. As she prepared tea, boiling water using biogas, she recalled how even making tea was previously difficult. She had to go some distance to collect fire wood, which took much of her valuable time, and it was a tedious job to light the fire. Working in a smoke-filled kitchen affected her health, and she often needed to spend money on medicines for respiratory problems.

While they were talking, her husband returned home from his fields, where this year he is growing soybean and cotton. He enthusiastically told the team that since Mangesh as manure on in his five acres of farm land and his tree nursery. He says the use of manure has improved the texture of the soil and increased its water holding capacity, resulting in higher crop yields. The nursery produces saplings of Sag, Gulmohor, Shisam, Bamboo, Dhokoma, Behada, Chinch, Keshy and other forest trees, as well as bamboo, which he sells in neighbouring villages, generating an income of Rs300,000 per year.

KJBF are working in this village as an Implementing Agency of the Convergence of Agricultural Interventions in Maharashtra (CAIM) programme, which is being implemented in six districts of the drought-prone Vidarbha region of the state by the Maharashtra State Agricultural Marketing Board with support from IFAD, the Sir Ratan Tata Trust and Government of Maharashtra.

Lighting lives and livelihoods

Solar lighting eliminates the need to burn kerosene and provides a livelihood for tribal women.

Balisahi is the most remote tribal village in R. Udayagiri Block of Gajapati district of Odisha state. There are two women’s Self Help Groups (SHG) in this village of 20 households. Other than savings and credit, the groups have been involved in various income generating activities, such as selling vegetables and the collection and processing of forest products. Like many villages in the tribal belt of Odisha, there is no electric power, but now not only are women using solar lanterns to provide light, they are also earning a good income from assembling and selling these lanterns.

This new way of generating income is an initiative of the Odisha Tribal Empowerment and Livelihood Project (OTELP). In November 2011, OTEL engaged Desi Technology Solutions as a training provider to teach 206 young women from seven SHGs (from five of the project districts) how to assemble solar lanterns and LED torches.

The selected women had little in the way of education (many were illiterate) but using diagrams and pictures they were taught how to use tools such as screwdrivers, soldering irons and...
multi-meters, and to assemble lanterns and torches from solar panels and batteries. Once they became confident in assembling the torches, they were then taught how to assemble lanterns. A total of 20 lanterns and 50 torches were assembled.

After completion of the technical training, the second round training started with the aim of giving the women an understanding of business practices and marketing techniques. This involved getting an in depth knowledge of the special features of the "Jyoti" (ray of light) solar lanterns and LED torches compared to other similar products in that are available in the market in terms of quality, longevity, warranty, price and other features. With this training, the SHG members identified the following places where they could sell their products:

- Nearby villages
- Local markets
- Retail shops in block and district towns
- Outlets of TDCCOL (Tribal Development Cooperative Corporation of Odisha Limited - a Government corporation)
- District showcase festivals, exhibitions and other occasions
- Outlet at Adivasi Ground, Bhubaneswar where the annual State Level Annual Adivasi Exhibition and Fair takes place
- Tribal schools

The SHG members have also considered boosting sales by paying commission to youths or other agencies to reach new locations with their products. They envisage that sales of LED torches will move fast, and create a good cash flow. The SHGs are selling two models of solar lantern (Laya and Divya) at prices of Rs2,100 and Rs1,750. Deducting the cost of materials, the SHG makes an average profit of about Rs400 per lantern. The LED torches are sold at Rs80 each, with a profit of Rs30 per unit. On average an SHG assembles 100 lanterns and 100 torches per month, making about Rs20,000 profit - which amounts to Rs2,000 per member. Solar lanterns are available in the market with a similar configuration as the Jyoti brand lanterns but at a much higher price.

Apart from training, OTELP field staff assisted the SHGs in preparing their business plans and facilitated loans of between Rs30,000 and Rs50,000 from the revolving funds available with Village Development Committees. The project is also in discussions with various government institutions to see if they can place some bulk orders with the SHGs.

Unlike other programmes, this initiative did not supply solar lanterns free to the beneficiaries, but rather took a sustainable approach with the transfer of technical know-how to rural women. These women then provide customers in remote villages with a source of renewable energy at an affordable price and, most importantly, a maintenance service on their door step. The SHG women are now planning to increase their product range by assembling street lights and other solar-operated equipment.

Before getting solar lights, most villagers used kerosene lanterns. A typical poor rural household on Odisha needs to buy around 60 to 80 litres of kerosene in a year at Rs12 per litre (an annual expenditure of around Rs840), which they often need to travel some distance to obtain. Solar lanterns can replace kerosene lamps, and are 40 times brighter, so dramatically improving the household illumination, meaning better health and more work hours at night. Better light also enables school children to complete their assignments and so continue their education beyond a primary level. Moreover diseases from caused by toxic smoke from kerosene lamps kill many people and these lamps also cause fires and burn injuries.

Demand for the solar lanterns is growing, and this initiative has certainly enriched the quality of the lives of tribal women, while also benefitting the environment through the introduction of a low-cost and sustainable green technology.

Livelihoods adapt as the city comes to the village

Much of the coastal area of Tamil Nadu is undergoing rapid change, with urban, tourist and industrial development in coastal locations. Some of the coastal villages covered by the IFAD-support Post Tsunami Sustainable Livelihoods Project (PTSLP) are being absorbed into urban areas. For example villages in Mutulkadu and Kovalam panchayats are being absorbed into the southward growth of the Chennai IT corridor. Where there used to be rice fields and coconut groves, high rise offices, retail malls and apartment blocks are being built. This change is creating new livelihood opportunities in the manufacturing and service sectors - such as catering services, transport and retailing.

An example of such new livelihoods is the sound service established in Kovalam panchayat. The Thirumalai Sound Service is also a good example of how households that were badly hit by the 2004 tsunami have been helped to rebuild their lives. The business was set up as a PTSLP-supported micro-enterprise in April 2013 by two sisters, Shannthi and Anjalai. Shannthi is a widow, having lost her husband, a fisherman, in the 2004 tsunami. Shannthi’s son, Chandrasekaran, who is handicapped in one leg from birth, is the anchorman of the business. PTSLP provided an interest-free loan of Rs180,000, which was used to lease a shop, buy equipment, and pay initial wages.
The business provides loud music for functions such as marriages, ceremonies at temples, housewarming and other occasions at a charge of between Rs1500 and Rs5000 per function. Chandrasekaran can cover up to two events per day, and the number of events varies from two or three up to five per month. The total turnover to date is Rs172,900, total expenses are Rs41,900, leaving a profit of Rs131,900, out of which Rs40,000 of the loan has been repaid to the Kovalam Pachayat Level Federation (PLF).

Chandrasekaran needs to keep up to date with the latest music and has bought a second-hand computer for Rs8,000, which he uses to download tunes. The income from the business enables him to support his mother and sister. Once the loan is repaid he would like to invest Rs200,000 in a generator and more sound equipment. His mother, Shannthi, says she would like help from PTSLP to set up a fancy goods shop for her daughter, who was married, but has been deserted by her husband. Overall the business has transformed the life of this poor family - Chandrasekaran says they could not even afford enough food and used to go hungry.

Knowledge management products strengthen project outreach

Development projects largely rely on face to face contact to promote new ideas, disseminate technologies and transfer knowledge. This contact is in the form of training courses, meeting project staff and community resource persons, and via membership of various groups and institutions. This face to face contact is made more effective if backed up by a range of printed, video and other materials. Moreover these knowledge management products can spread information and knowledge to households who are not members of project groups.

The recently completed Uttarakhand Livelihood Improvement Project for the Himalayas (ULIPH) generated a significant volume (over 60 or 70) of various types of printed material (training manuals, booklets, reports, studies, newsletters, posters, games, calendars and diaries), along with about 30 videos, as well as having an active website. In addition to these physical products, the project developed systems for internal information sharing such as e-documents and regular review meetings. In 2011 the project started holding Gyan Sabhas, an interactive knowledge sharing event at village/cluster level, organised by the local Community Resource Person (CRP) or project field staff in successful demonstration fields of progressive farmers with the objective of sharing best practices, disseminating information, and facilitating replication. In 2011 210 Gyan Sabhas were organized, covering 2,808 participants.

An assessment of Knowledge Management materials (Review of Existing Knowledge Sharing Materials, Anmol Jain, 2012) found that these materials had effectively supplemented the extension efforts of the project staff in promoting alternate livelihoods, reducing drudgery, and bringing about changes in practices at household and community levels. Findings of the study include:

(a) Community members and ULIPH field staff reported that the materials were of good quality. “It is easy to understand through the pictures and in future and more publications like this must be brought out in the future,” remarked Geeta Verma, an SHG member from Almora district.

(b) Respondents said that they been able to get a lot of information related to cultivation techniques. Members from Uttarkashi district said: “The literature shared by ULIPH made us aware about the techniques of organic farming and vegetable cultivation and subsequently many people in our village benefitted from this knowledge,” “The booklets by Ajeevika greatly helped us to learn and adopt vermicomposting techniques”.

(c) The women respondents in particular said that they really liked watching video documentaries as they not only got useful information but also a source of entertainment “Apart from imparting useful information to us, documentaries are also a source of fund and entertainment especially if several women are watching a documentary together,” remarked Beena Devi, an SHG member from Bageshwar district.

(d) Gyan Sabhas proved to be a highly successful knowledge sharing mechanism. According to Pradeep Yadav, “through the Gyan Sabhas the farmers are able to see for themselves the impacts of the various package of practices resulting in high adoption rates.”

(e) The success stories documented and circulated by ULIPH have motivated farmers, especially women, to take up improved livelihood practices. “By reading the success stories we felt motivated that if another woman can do it then why can’t we do it,” (Sanju Bora, an SHG member from Bageshwar district).

(f) Significant changes in the community attitudes and practices relating to personal hygiene and food habits have been observed, which have helped in reducing the incidence of diseases among the households from project
According to Heera Singh Jadoda, CRP from Chamoli district “Waterborne diseases have been reduced by at least 20-30% ever since households have started boiling water.”

Although the SHG and Federation members were primary target groups of the knowledge sharing materials, information has also trickled down to family members: “I am making vermicompost for the past several years based upon the knowledge I acquired from the books that ULIPH gave to my mother who is a SHG member,” (Pushkar Singh Dakuni from Bageshwar district).

Lessons learned from this experience include:

- Printed and video media are an effective means of disseminating information and other messages to the rural population.
- A large number of booklets and other materials need to be printed to ensure they reach the intended numbers of households.
- Videos were well liked but had quite limited circulation, partly due to lack of video players and electric power cuts (although in one village they were reaching a larger audience via a local cable TV network).
- Materials need to be produced at the appropriate stage of the project cycle, and more technical information would have been useful.

In north-eastern India CURE’s Technical Innovation Services (TIS) worked with the International Centre for Mountain Development (ICIMOD), the Regional Agricultural Research (RAR) station in Diphu, Assam and at the Indian Council Agricultural Research centre at Borapani, Meghalaya, to link this work with two IFAD loan funded projects with activities in Meghalaya, Assam and Nagaland - the North East Regional Community Resource Management Programme (NECORMP) and the Meghalaya Livelihood Improvement Project in the Himalayas (MLIPH).

In the first phase of CURE, the following work was done on upland rice in north-east India:

a) Validation of three improved upland rice varieties at sites in Manipur, Meghalaya and Assam. In Meghalaya yields of over 2.5 tons per hectare were obtained and farmers said that they would continue to use these varieties, although the earlier maturity of the new varieties in the Garo hills of Meghalaya did lead to problems of bird and wild animal damage.

b) Seed villages and community seed banks for the multiplication and distribution of seeds of improved varieties at various locations in Meghalaya and also in Manipur and Nagaland. In Meghalaya, with collaboration from MLIPH, three seed villages were developed with 17 farmers producing 22.5 tons of seed in 2013. Along with packs of seed farmers got leaflets with technical advice and videos (distributed on CD). A seed storage structure, made of bamboo and other local materials was demonstrated.

c) Training and exposure visits organised by RAR Diphu for farmers and staff from IFAD projects on upland rice production technologies. In response to feedback from farmers, later training and visits also included the management of citrus and other fruit tree orchards.
Following one of the exposure visits, one of the participating farmers, Mr. Madhunath Sangma, said: “It is a great experience for me. Now I am realizing that we have so many things to learn to develop our agriculture. Farmers are not alone. There are many people thinking about their welfare, willing to work for the farmers and with the farmers. We must convey to our fellow farmers what we have observed today”.

Mr. Madhunath Sangma (a farmer), with Dr. Ramen Kumar Sarma of Assam Agricultural University

Author: Dr. Ramen Kumar Sarma, Principal Scientist, Assam Agricultural University.

Community services to support goat production

Background

Goat rearing is an enterprise that is both suitable for poor households who own little or no land, and is resilient to climate change. Goats largely browse shrubs which are more tolerant of rainfall variations than the grasses that are eaten more by sheep, cattle and buffalo.

The project, Small ruminant value chains as platforms for reducing poverty and increasing food security in dryland areas of India and Mozambique (imGoats), was implemented in Udaipur district in Rajasthan from 2011 to 2013. The International Livestock Research Institute (ILRI) partnered with BAIF Development Research Foundation, an NGO, to implement the project. The project worked with 2,685 goatkeeper households in two blocks of Udaipur district in Rajasthan. These were organized into 244 groups that were facilitated by 25 community based service providers called Bakri Mitra (field guides). These are local goat-keepers with some education who are trained on improved goat husbandry practices. They also are the link between the goat-keepers and the Animal Health Department staff, with whom they work closely.

The biggest outcome of the project was adoption of improved practices regarding health, feed and breed management among the goat-keepers linked to improved market participation. The training of the Bakri Mitras was also an important step towards improving animal health service delivery in rural areas. Below we share the experience from a female Bakri Mitra named Roopi Bai.

The story of Roopi Bai - Bakri Mitra

Roopi Bai lives in Galder village with her husband Bherulal Garasiya and their two sons and two daughters. She is the only woman among the 25 Bakri Mitra trained by the imGoats project. While Rajasthan is traditionally a male dominated society, Roopi Bai is able to work as a Bakri Mitra thanks to the support and encouragement of her husband. She works for 5 to 6 hours a day visiting a selection of the 40 households in Galder village. She also trained her husband to perform certain basic treatments so that he can provide the services in case she is not available. They both are knowledgeable and their skills are in demand.

While she always kept animals (as did her parents and everybody else in the village), she didn’t think that she could earn an income from her knowledge. Before training as a Bakri Mitra, she mostly spent her time at home running a small grocery shop (Kirana) and a flour mill, and also tailoring. She and her husband developed these activities step by step, learning on their own and following guidance from others such as the local teacher. Roopi Bai’s overall personality evolved over the period of the project in the following roles:

Group facilitation: Roopi Bai facilitates four goatkeeper groups (40 households). Her facilitation skills improved over time. Initially the group members were sceptical but after they saw her perform different activities and interact with veterinary officers, she gained their confidence.

Innovation: Roopi Bai participates in imGoats “innovation platform” meetings, and uses this as an opportunity to raise issues pertaining to her village. She helped developed and execute action plans, resulting in an expanded scope of activities of the innovation platform.

Group participation: A self-help group of Bakri Mitras was started in June 2013. The main purpose of the group is to be able to purchase veterinary drugs in larger quantities to save costs. Roopi Bai is the frontrunner in terms of the volume of medicines purchased. From December 2013 to March 2014, she purchased medicines worth Rs2,000 through the group, and also purchased an additional Rs2,000 of medicines from the local pharmacist to meet urgent requirements.

Entrepreneurship in service delivery: Roopi Bai was one of the first Bakri Mitras to start charging for her services and then convinced her colleagues to do the same. She has also expanded her services beyond her group members and is now assisting 100 households in her village.

Bherulal Garasiya and Roopi Bai

While the amounts the Roopi Bai charges are small (Rs 15 to treat an injury, Rs 6 per animal for de-worming or vaccination), she is able to make a reasonable amount of money. She earned Rs1,000 per month for de-worming animals between September 2013 and April 2014. She also supported BAIF with...
PPR vaccination (the main killer disease in goats) and received Rs 2,848 for her services. Enterotoxemia (ET) vaccinations were given to about 300 animals in June 2014, giving her a net return of about Rs 1,000.

Conclusion

While her Bakri Mitra activities are still expanding, this still remains a secondary source of income for Roopi Bai and her husband. What is also important is her increased confidence in her interactions with people. She believes that her services are helping people to save their animals. Initially she used to go door to door to convince goat-keepers in her village to avail of her services. Now many of them bring their goats to her door-step to get them treated, especially for injuries. She feels this is a positive sign of the growing awareness of the benefits of health-care and also confidence in her ability to provide treatment.

Story and pictures from R Bendapudi (BAIF), R B Patel (BAIF) and S Hendrickx (ILRI)

Development of climate change-resilient technologies for rainfed farming

To improve the productivity and sustainability of rainfed agriculture in three Asian countries (India, Laos and Vietnam), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) has started to implement an IFAD grant funded project “Sustainable management of crop-based production systems for raising agricultural productivity in rainfed Asia”. The four-year project started in 2012 and aims to make rainfed cereal/legume cropping systems more resilient and productive. This is being done through deploying farmer-friendly agricultural technological innovations; decision-support including drought forecasting and crop diversification strategies; sustainable local seed support systems, and opportunities for value addition at the local level.

In India, the project is working alongside IFAD loan-funded programmes in three states (Jharkhand, Madhya Pradesh and Rajasthan). Highlights of the first two years of project activities in these states include:

**Jharkhand:** farmers in three districts, who are members of Self-help Groups (SHG), have been provided with quality seed of improved varieties of chickpea, pigeonpea, and groundnut. The improved chickpea cultivars were supplied to 34 SHGs; pigeonpea cultivars to 121 SHGs: and groundnut cultivars to 58 SHGs. Each SHG has around 10 to 12 members. The farmers using these improved cultivars are getting 20-25% higher yield levels. In addition the Kabuli chickpea varieties get a premium price in the market when either sold as grain or green (as a snack or vegetable). Seed has been saved by the participating SHG members and sold to other farmers, thus disseminating these benefits more widely.

![Roopi Bai receiving training materials](image)

Normally farmers in this region only get a single crop per year. A total of 1,107 farmers attended three training courses, two farmers’ meetings and one field day. These farmers gained knowledge on using integrated crop management practices to utilise residual soil moisture, and therefore take on a second crop, resulting in increased income.

**Madhya Pradesh.** The project has addressed some specific problems that limit the productivity of important pulse crops. Prolonged rains during early stages of the pigeonpea crop can cause waterlogging resulting in plant mortality and even leading to the complete failure of the crop. To prevent this farmers were advised to grow pigeonpea on ridges with a spacing of 75 cm between ridges and 30 cm between plants. Demonstrations in farmers’ fields showed that ridge planting not only protected seedlings from prolonged rains, but also increased yield by 27% compared to flat sowing in control plots.

![Kabuli chickpea variety KAK-2 (yellow crop) grown by a farmer in Jharkhand](image)

Root diseases cause losses in chickpea, but this can be controlled by seed treatment. Demonstrations of treatment with Thiram (2g) + Carbendazim (1g) per kg of seed were carried out using extra-large seeded Kabuli variety KRIPA. The yield from the treated plot was 22% higher than the untreated plot and convinced the farmers that the seed treatment protected the crop against the root diseases.

The timing of insecticide sprays is very important to reduce losses and minimise the cost of inputs. Farmers often spray at the wrong time which is not effective and a waste of money. To provide a solution to this problem, installation of pheromone...
traps at 5 per acre at the time of 50% flowering was suggested. Demonstrations were conducted using the improved chickpea varieties KRIPA (Kabuli type) and RVG 202 (desi type) in two districts. In plots where the traps were installed, the productivity was 20% higher than the plots without the traps because farmers were alerted for a spray when they saw 5 adult male moths per trap.

Rajasthan: millet is a staple food grain in this arid state, and the project introduced 3,061 farmers to improved cultivation methods: seed treatment, line sowing and application of balanced fertilizers as well as seed of the improved pearl millet hybrids HHB-67 and 86M86. Each farmer used this improved package of practices in one acre and, in spite of heavy rainfall during the ripening stage which caused considerable losses, the improved plots produced about 50% more grain than those using traditional methods.

Success story 1: The magic of Swarna

Ramdev Chaudhary, 48, is a resident of Karmaha Village, Dhani block in Mahrajganj District of Uttar Pradesh. Karmaha consists of 200 farming households owning 950 acres of arable land, of which 600 acres are low-lying. Dhani block is situated on the bank of the Rapti River and, with several small rivers that rise in Nepal flowing through the middle of the block, 75% of the area is prone to flash floods between July and September.

The livelihood of Ramdev's family totally depends on rice production on his 2.5 acres of land. In the kharif season, 2 acres of land are always submerged due to flash floods, damaging the rice crop and resulting in a shortage of grain for food and straw for animal fodder. Ramdev had tried several improved varieties, but these also suffered from floods and he still failed to produce sufficient rice. He was getting into increasing debt through having to purchase food and fodder. Ramdev was giving up hope of getting a decent crop.

Ramdev then heard about the IRRI-IFAD project and visited the local office of GDS, an NGO responsible for field implementation in the area. Here he was told about a new variety of rice, Swarna-Sub1, which can withstand a period of total submergence. He decided to test the new variety in his field thinking that the variety could be the solution to his long-lasting flood problem. He received 5 kg of seed of Swarna-Sub1, sufficient for 0.08 ha of land. With help from GDS he used the new rice establishment technique of direct seeding with a zero-tillage machine into the stubble of the preceding crop. The plot was submerged for the first time during the last week of July and for a second time from 15 to 25 September 2013. Most of the rice crops of the village were badly damaged by these floods but Ramdev's Swarna-Sub1 was only slightly damaged, and was able to regenerate and produce more tillers. Swarna-Sub1 produced 400 kg of grain from 0.08 ha while the crops of other farmers failed completely.

Ramdev and his wife were very happy to obtain a good rice yield (5.0 tons per ha) from their flood-affected field. Ramdev explained that this is very good for a flood-affected area. They saved sufficient seed for next year's crop, and used some grain for household consumption. They also distributed 120 kg of Swarna-Sub1 seed free of cost to their relatives and neighbours.

Raj Kumar is a small farmer in Kahrpurva, a flood-prone village with 50 rice-farming households. Floods have damaged their crops of other farmers failed completely.  

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Maintaining rice production as the climate changes

Changing rainfall patterns are making life difficult for many farmers who rely on rice as their major food crop. Increasing frequency and severity of floods destroys crops, while reduced down-stream river flows, storm surges and rising sea levels have increased the intrusion of sea water into coastal crop-lands. An IFAD grant to the International Rice Research Institute, "Improved rice crop management for raising productivity in the submergence-prone and salt-affected rainfed lowlands in South Asia", funded by the European Commission, ended this year. This grant has been helping develop and disseminate ways of growing rice in flooded and saline environments.

Success story 1: The magic of Swarna-Sub1 has many surprises for poor small holder farmers

For further details contact: Dr Pooran M Gaur, Coordinator, IFAD Grant I-R-1363 – ICRISAT, ICRISAT, Patancheru 502 324, Telangana, India. Email: p.gaur@cgiar.org
Raj Kumar received 5 kg Swarna-Sub1 seed for his lowland flood-prone field from the IRRI-IFAD project. He transplanted an area of 0.33 acres with this seed. The field was submerged twice for a total of 15 days. Although flooding at the early growth stage affected the number of tillers, he still harvested 580 kg from the plot (over 4.2 tons per ha), which was almost double the normal yield of locally grown variety BPT 5204 (2.25 t/ha). He said that Swarna-Sub1 grew very well and everyone was surprised with the performance of this variety after flooding. More tillers and more grains per panicle were recorded in Swarna-Sub1 than in other varieties grown in the area. Moreover they could risk using more inputs and so invest for higher yields. Raj Kumar also said that the quality of rice was better than that of other varieties. “We will definitely be growing this variety in the next season and will share seeds with relatives and neighbouring farmers” was his final verdict.

Authors: Ramesh Kumar (Grameen Development Services, Mahraiganj), Sushil Kumar Dwivedi, Sudhanshu Singh (International Rice Research Institute)

Success story 2: Improved nursery management results in higher rice production in coastal areas

Healthy, robust and vigorous seedlings improves rice production through better stress tolerance and efficient use of resources, says Birbal Sardar, an IRRI-IFAD project farmer of Simulhati Village. Simulhati is a salt-affected village in Sandeshkhali block of North 24 Parganas District of West Bengal. Farmers here largely rely on rice, but yields are low due to the salt-affected soil and high seedling mortality after transplanting. The unbalanced application of fertilizer in the nursery and poor nursery management practices are other reasons for poor yields.

In 2012, a team from the Canning Town Regional Research Station of the Central Soil Soil Research Institute, responsible for the local implementation of the IRRI-IFAD project, reached Simulhati Village to introduce the idea of “Improved Nursery Management” practices for the high-yielding variety Amal-Mana. In the beginning, the farmers were reluctant to use P and K fertilizers in the nursery because of they thought that they would make the soil hard and so create problems in uprooting seedlings. A meeting was held in the village to discuss this issue and it was finally agreed that the villagers would try this practice to see if it worked. Birbal Sardar was one of the cooperating farmers.

Previously Birbal was growing the Masuri variety, using a high seed density (>75 g/m²), only applied urea fertilizer at 25 kg/ha. The soil of his field was saline (4.6 dS/m). Now he sowed the variety Amal-Mana in the nursery, with a lower seed density of 40 g/m², and applied balanced fertilizer to the nursery plot (50-30-15 kg of N-P₂O₅-K₂O/ha plus five tons of manure). He transplanted the seedlings at 40 days of age. The results he obtained surpassed his expectations: the yield was 36% higher than what he had usually obtained. The higher yield is mainly due to the improved variety and nursery management practices, which produced vigorous seedlings that can withstand salinity.

Birbal was happy to share his results with fellow farmers of the village, who had been reluctant to adopt the improved nursery management practices. However, after seeing his success, all farmers are now convinced of the fact that the use of an improved variety and balanced nutrition in the nursery are the key to the success of rice cultivation. This technology, coming through the IRRI-IFAD project, has a potential to increase average yields by 0.5 to 1.0 t/ha, not only in the stress-prone coastal areas of West Bengal, but also in the adjoining areas of Bangladesh.

Authors: S. K. Sarangi (CSSRI, Canning Town), B. Maji (CSSRI, Canning Town), Sudhanshu Singh (IRRI, New Delhi)

Innovation platforms as a route to dairy development

In the hills of Uttarakhand climate change is leading to reduced water from snow-melt being availability for irrigation and more extreme weather events. This is making crop production difficult and some crop land is being abandoned. Men are migrating to find work and many of the women remaining in the villages would like to earn an income from milk production.

The International Livestock Research Institute has adopted an innovation platform approach as a route to dairy development in the hills of Uttarakhand. Innovation platforms are a way to bring together different stakeholders to identify solutions to common problems or to achieve a common goal. They ensure that different interests are taken into account, and that various groups contribute to finding solutions. Used by the private sector for many years to gather information and improve networking among key stakeholders in a particular economic sector, they caught the attention of development agencies at the end of the 1980s. They are now increasingly common in research and development initiatives.

This case study illustrates how the Innovation Platform (IP) approach is being used by the project “Enhancing dairy-based livelihoods in India and Tanzania through feed innovation and value chain development approaches” (Milkt), which is being funded by a grant from IFAD. In Uttarakhand the project is working in two districts, with two village clusters - each of four to six villages - in each district. Initial meetings of the innovation
platforms in each cluster identified the following main constraints and issues where interventions are needed:

- Lack of market access and high transaction costs
- Distance to road/ lack of accessibility to road
- Low price for milk from Aanchal, the state dairy cooperative
- Wastage of fodder (estimated at 20-30%) through inefficient feeding systems
- Shortage of green fodder in several specific periods
- Poor availability and high cost of concentrate feeds

**Innovations emerging from application of the IP approach:**

Jeganath women’s dairy cooperative was formed in February 2013 by female members of a self-help-group (SHG) associated with the Bageshwar dairy value chain IP. Their aim was to sell their surplus milk at a higher price than that being offered by Aanchal, the state dairy cooperative. Milk is now being collected from 7 villages and sold in the nearby town of Bageshwar directly to consumers through a rented shop, and to tea shops. As a result farmers are receiving a price which is 20% higher than for the previous marketing system. Initially, only 35 farmers were participating with 40 litres of milk per day but soon this reached 120 litres from 105 farmers. Each woman is earning Rs600 to Rs4,000 per month and eight members have been employed along the value chain for collection, transport and marketing of the milk, providing each with an income of Rs1,000-7000/month.

The new attractive market for milk has motivated farmers and encouraged them to replace their local cows with higher-yielding cross-bred animals. Dairy is now considered as an important means of income generation and is reducing the migration of some younger people. The initial capital investment for the purchase of equipment (chillers, cans, milk analyser) was supported by a grant and a loan from the Integrated Livelihood Support Project (ILSP), which is being supported by an IFAD loan. The dairy cooperative is now being operated independently by its members, and earned a profit of Rs60,000 over the period of 16 months.

For this work. Photo by Thanammal Ravichandran.

**The IP as a platform for the convergence of support.** IP members include the National Agricultural Bank for Rural Development (NABARD), commercial banks and the local Animal Husbandry Department. These agencies are supporting farmers through credit and subsidy for the purchase of high yielding animals and for the renovation of cow sheds. NABARD has taken the decision at state level to scale up the IP approach in 3-4 more clusters of other districts in collaboration with ILSP. Krishi Vikas Kendras (KVKs), local research and development centres have provided technical support to farmers for the construction of feed troughs, shelters and for the purchase of grass seed.

Initially, it was difficult to attract private institutions to the IP meetings. However after a while private milk traders have taken the initiative to collect excess milk from these clusters at competitive prices in order to supply restaurants and sweet shops with milk. TARA, a private feed company, has also shown interest to enter into an agreement with women farmers for long term supply of concentrate feed at competitive rates. A private agricultural equipment supplier from Haldwani, the local commercial hub, has agreed to supply Mounted Scythe Chaff Cutters (Gujarat model), which are in demand among the farmers for chopping fodder, but are less expensive and labour demanding than standard models found in the plains.

![Women farmers discussing their problems in an IP meeting in Kolseer village, Bageshwar. Photo by CHIRAG](image)

**Improved feeding practices** can be observed among the farmers participating in IP meetings. These include the construction of feed troughs and the use of chaff cutters to reduce fodder wastage. This helps to decrease the labour needed for collection of fodder from hilly areas and reduces the feed constraint. Feeding of concentrate feed to increase milk yield, cultivation of high yielding dual purpose cereals and planting fodder crops have also emerged as solutions to the constraints in feed supply. Loans from ILSP have been used to purchase concentrate feed directly from TARA.

**Impacts:** improved livelihoods are becoming apparent as the result of the interventions. Income from dairy production is managed mainly by women and used for household expenses, to pay school fees and to buy inputs. Some households have invested in crossbred dairy animals as well other enterprises such as poultry or in a vehicle for hiring out. Community-based interventions through the IP approach have given people confidence that the dairy enterprise is profitable for women farmers in these hill areas.

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