Gender and State Climate Change Action Plans in India

Research and policies to enable poor women and rural communities adapt to climate change

Best Practices

Alternative Futures

Partners

Development Research Communication and Services Centre (DRCSC), Kolkata, West Bengal (www.drcsc.org)

Gorakhpur Environmental Action Group (GEAG), Gorakhpur, Uttar Pradesh (www.geagindia.org)

Central Himalayan Environment Association (CHEA), Nainital, Uttarakhand (www.cheaindia.org)

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1. Climate-resilient seeds and women's traditional knowledge

Seed Bank in Sunderbans, West Bengal

West Bengal: Farmers have gone back to growing local traditional paddy varieties, in contrast to high-yielding varieties available in government shops, in North and South 24 Paraganas districts. This has reduced input cost of farmers and led to higher yields in the saline floodwaters in these coastal districts. This has been an especially useful intervention post the 2009 Cyclone Aila as the traditional varieties have proved to be more saline and waterlogging tolerant; they also grow during dry spells and are less vulnerable to pests and local climatic stresses. With cyclones becoming more frequent, unpredictable and intense due to climate change, the traditional paddy varieties are being preserved and their use is being expanded by DRCSC, a grassroots organization in the state.

Uttar Pradesh: In the eastern districts of Gorakhpur, climate change impacts have delayed rains, which now often come when the paddy is ripe for harvesting or has just been harvested in September-October. To adapt to this, Gorakhpur Environmental Action Group (GEAG) has been propagating *Saatha*, a traditional variety of paddy that matures early, or in 60 days (the number 60 is called '*saath*' in Hindi). It also grows well in mixed cropping along with jute and traditional coarse cereals or millets. In this mixed cropping, rice is harvested first, then, *bajra* millet and post-flood jute is harvested. Later on, the winter crop, or *rabi* is sown.

Saatha is well suited for small and marginal farmers as it adapts well to climate change impacts. The variety requires minimal inputs. It is a rainfed crop and if rains fail, it requires just one or two irrigation unlike the conventional high-yielding paddy varieties. It grows well with bio-inputs and chemical fertilizers in fact restrict the formation of paddy grains. It is also free of pest attacks so does not need any investment in pesticides. Even weeding is done just once. After the harvest, the stalks are given as compensation instead of cash payment to agricultural wage labourers as they prefer to use these for their hut roofs.

Ultimately this variety has a high cultural value and is in demand for *chhatt*, a popular festival, held at the time of its harvest. Though the yield is not very high, it withstands delayed rains and ensures food security during the flood season.

From a Gender Lens

Promoting and conserving traditional seeds has undoubtedly enhanced food security for both men and women. This option is preferred by villagers to the high-yielding varieties given by government outlets because traditional seeds survive saline waters better and the crop waste can be used as fodder and fuel by women. High-yielding varieties do not yield usable byproducts. Traditional varieties require less labour by women in terms of less weeding. It also enables them

to do multi-cropping, especially grow local millets which are hardy and nutritious. The *bajra* millet harvested after *saatha* provides fodder.

It gives women an opportunity to save their seeds, instead of buying them from the market, a task which is done by their men and all decisions regarding seeds is then predominantly with men. Women are able to exchange traditional seeds, keep the healthy ones and reclaim their traditional knowledge. Growing these varieties also fulfills their cultural needs.

Policy Options

Both the scientific technologies and the adaptive knowledge from the field need an exchange from laboratories to farms and vice versa.

Knowledgeable and willing farmers, especially women need extension support and be taken in as trainers. Local variety seeds are not available at all in government stores. Government should promote and make available traditional seed varieties, vermincompost, neem paste, etc from government shops and through the Panchayats, block-level offices and agricultural extension workers.

Further Reading

1. Resource organisations: GEAG (http://www.geagindia.org/) and DRCSC (www.drcsc.org)

2. Grain banks contribute to women's empowerment

Madhya Pradesh: The Madhya Pradesh Rural Livelihoods Project (MPRLP) is being implemented in nine districts of the State. Grain banks are one such initiative that is helping small and marginal farmers at the time of drought and crop failure.

NGOs in the State have been setting up grain banks for the past decade. In *Betul* district, for instance, grain banks exist since 2001 and are now seen in 30 villages covering over 700 households majority of which are very poor. Grain banks are particularly used during crop failure.

Grain Bank in Sunderbans, West Bengal

Uttar Pradesh, West Bengal: Grain bank is based on the traditional concept of keeping aside a little grain everyday for use in times of distress. Grain banks are being promoted in the flood-prone regions of Gorakhpur district in Uttar Pradesh and in the Sunderbans in West Bengal. In Gorakhpur, grain banks are located at a central place in a village and are on higher ground so that they are not washed away by floodwaters. Usually made of bamboo or bricks, its roof is often made with bamboo and straw – all locally available materials. Grain banks are 'owned' and 'managed' by women's self-help groups and used during emergency, including crop failure. In Sunderbans too, women's groups manage the grain banks, deciding how much to lend and what the interest is going to be. Interest is earned in kind where borrowers return extra grain after the next harvest.

Gender Lens

Grain banks ensure food security for both men and women during lean periods, as also during and after disasters. Managing grain bank empower women to take decisions on running the bank. They collectively own, control, and manage a community resource and often earn respect from the menfolk. Women's negotiation power within homes has increased because men now ask women whether they should borrow from the grain bank or not and discuss coping/adaptive mechanisms with them. Again, women's ability to secure grains during emergency has led to reduction in debts, thereby giving women a higher status within households.

Policy Options

Grain banks should be made mandatory in every panchayat through women's groups and resourced through adaptation interventions integrated with the Village Development Plans developed by Gram Panchayats. These plans should be 'Local Action Plans on Adaptation' or LAPAs. In addition to rice, storage of diverse grains including local millets should also be promoted.

Further Reading

1. Resource organisations: GEAG (http://www.geagindia.org/) and DRCSC (www.drcsc.org)
2. 'LAPAs' recommended first in Kapoor, Aditi (2011). Engendering the Climate for Change: Policies and Practices for Gender-just Adaptation. Alernative Futures, New Delhi
3. Madhya Pradesh grain banks: www.mprlp.in
4. Government of India Grain Bank Scheme: http://dfpd.nic.in/?q=node/222

3. Organic Agriculture is resilient but more labourious

Madhya Pradesh: The State is unique in having a well-defined organic farming policy which is being implemented through the government's agricultural extension network including the local centres called *Krishi Vigyan Kendras (KVKs*). Use of organic waste, bio-fertilizer etc. is making small farmers self-sufficient as they do not have to depend on the markets to buy external inputs. Instead, they are now able to follow a cyclic, integrated farming system, optimally using various diversified livelihoods options – farming of cash and food crops, agro-forestry, mixed cropping, vegetable and fruit crops, cattle rearing and dairy farming, poultry rearing and even inland fishing. Most importantly, this has resulted in improved soil fertility and optimum use of water.

Uttarakhand: The government's National Bank for Agriculture and Rural Development (NABARD) is promoting organic agriculture in various ways. In 14 villages of *Tarikhet* block, organic practices for off season vegetable cultivation are being facilitated through forming farmers' groups (including women farmers' groups), and building their technical capacities on farm organic inputs, integrated pest management, organic certification and water management and setting up of rainwater harvesting tanks.

Organic agriculture is also promoted by grassroots organizations in Gorakhpur, Eastern Uttar Pradesh and in the Sunderbans in West Bengal as part of integrated agriculture (see below).

Gender lens

Organic farming ensures additional food security for both women and men but at the same time it demands more manual labour and time from women and increases their workload. Women collect raw material for organic manure and bio-pesticides, process these and shoulder the larger workload of applying it in the field. Women also have less access to information/knowledge from extension workers. They still do not access, own or control productive assets like land, credit, technology and tools. They still do not become trainers in extension services, nor sit on decision-making bodies like agriculture primary societies or market boards.

Policy options

Government programmes should promote labour-reduction measures like group-based manufacturing of vermincompost or bio-pesticides. This will enable some women to take this on

as a livelihood option (rural women entrepreneurship) and give a choice to women to buy organic compost.

Organic manure should be available from government shops and with Gram Panchayats; it should be accessible to women farmers' clubs/groups by the village Panchayat and the block.

Daily regional weather-related information should be available to women farmers over mobile-phones through discounted subscription.

Rain gauges should be provided to women groups so that they can get more precise information on when to sow or harvest since more women than men undertake these two activities. They should be made weather literate and be helped through panchayats to link local rain data with weather stations so that local variations can be addressed through weather information.

Agricultural extension services through *KVKs* and information on organic practices should be strengthened and expanded to reach women through women's groups/women farmers' groups.

Further reading:

1. MP Organic Farming Policy can be downloaded from: http://www.mpkrishi.org/krishinet/hindisite/pdfs/Javikneeti_Eng.pdf

4. Regeneration of Van Panchayats saves time and brings income

In the hill state of Uttarakhand, women have taken the lead in many places to save degraded forests around their villages because they depend on them for food, fodder and firewood. One such experiment in districts Almora and Nainital has led to the plantation of six to eight tree and shrub species in 15 villages. This initiative is by village Van Panchayats (*van* means forest in Hindi), a government scheme bringing together forest department officers and villagers to jointly manage village forests. A third of the members of the executive committee and half of the general body members are mandated to be women. The Van Panchayat scheme has given legal recognition to a century-old practice of villagers preserving their adjoining forests. Without active participation of people, especially women, these forests do not survive.

Plantations in these forests usually happens naturally but women here have directly sown about 100,000 acorn (seed) of oak and *Bahunia variegate* in about 30 ha of forest land to fast-track availability of broad-leaf trees which will later given them leaf fodder. To avail fodder in the short run, three to four improved fodder grass varieties have also been introduced in the forest. These grasses have also been planted on the ridges of agricultural land by individual families.

Gender lens

The plantation of fodder grass close to the house has reduced women's time in collecting fodder. It has helped improve the health cattle, increase milk yields and nutritional status of the families. Some sale of animal products has put money in women's hands. Women are also able to access firewood closer home. Of course, women are putting in labour in sorting, grading, sowing and at times transplanting fodder seeds but the time and labour saved in collecting the fruits of this labour far outweighs this burden. This collective action has also reduced women's drudgery of fetching 35-40 kg headloads of firewood and fodder from afar - through busy roads or animal/insects-infected degraded forest lands.

This conservation and regeneration has to some extent enhanced women's knowledge and skills on collection and preservation of fodder seeds, methods to cultivate them and nurture them to accelerate the vegetative cover. Most of the physical work is done by men and women have to ensure that the tasks get done. Their management skills and adherence to quality are essential to successful regeneration of the forest patches. Women have been able to increase incomes and food security from cattle because fodder is now available.

Policy options

There are several government schemes that can help villagers conserve Van Panchayats as long as the implementation is done in collaboration with local NGOs. Some of the State legislators are keen to push for regeneration of degraded lands even on the plains in this hill state so incentives through Panchayats, blocks and priority use of legislators' own funds can yield good results.

To access more funds and drive, Van Panchayats must dovetail their work with Village panchayats, which have the functional, administrative and financial powers over all village matters and are incharge of making development plans for the entire village. Currently, the two separate structures of Van Panchayats and village panchayats are not able to build on each other's strengths. Village panchayats are incharge of several schemes, including bank loans from NABARD and the employment-generation scheme – the National Rural Employment Guarantee Act. Funds for Van Panchayats can be included in the village micro-plan for resource mobilization. This will ensure that women's needs are met. Given that 50% of elected posts in village panchayats are reserved for women, this is a good opportunity for women to be in decision-making roles.

Further reading:

1. Resource organisation: Central Himalayan Environment Association (CHEA) www.cheaindia.org
2. About Joint Forest Management: http://www.moef.nic.in/sites/default/files/jfm/jfm/html/strength.htm

5. The importance of managing Common Property Resources (CPRs)

CPR: On a mud embankment on panchayat land in Sunderbans

West Bengal: Marginal and landless farming families of West Bengal suffer from chronic shortage of food, fodder and firewood, leading to male migration, which in turn increases the burden of work on women. The rapid disappearance of grazing lands along with reduced access to forests or common lands is creating an acute crisis for fodder. Conversely, common properties like fallow lands, water bodies, river and pond banks, embankments of irrigation canals, roads and railway tracks etc. either remain unutilized or are degraded due to overuse by communities, resulting in soil erosion and disruption of the local ecosystem.

About six years ago, a local initiative began to revive fallow and degraded lands for use by local communities. Currently, across the State, this 'common property resource (CPR) management' has spread to over 50 groups comprising 1,055 members. CPR Management has been taken up with support from village panchayats. Altogether, a stretch of about 98 km of common property land has been planted with diverse trees and shrubs. In terms of the ecological benefit, large trees provide shelter and food to birds, small animals and insects. Plantations reduce green house gas emission, resist soil erosion to a large extent and act as a barrier to cyclonic storm for nearby crop fields. It also gives an opportunity to bring back the number of native tree species which were at the verge of extinction. If practiced on a mud embankment, like in Sunderbans, it gives protection against erosion.

In financial terms, the preparation of 5000 seedlings in a nursery cost Rs. 7000-8000 and their transplantation and protection an additional Rs 8000, excluding labour. These were the costs in each of the two CPR management initiatives in Ramganga and Sagarmadhabpur villages of Patharpratima block in district South 24 Paraganas in the Sunderbans. But the investment is worth it. In district Birbhum, for instance, the 3 panchayats of the district have adopted this model of growing community-managed multi-species, multi-purpose woodlots and are trying to promote this further through women's self-help groups (SHGs). Some of these groups have already earned revenue of up to Rs. 3 lakhs by auctioning mature trees.

Gender Lens

Women shoulder most of the work in CPR Management, especially jobs requiring intense labour. The larger number of seeds, especially those of traditional varieties, are collected and preserved by women. Women prepare the nursery soil which includes packeting of soil, preparing the beds and placing the soil packets on them. Women sow the seeds and irrigating them, cut and prune the nursery plants, apply manure/compost and clay soil, transplant saplings from the nursery to the CPR field and are responsible for the day to day monitoring and maintenance of the CPR fields. Men share the earth works for plantation (digging pits). Inter-crop cultivation is also a woman's job. Collecting fodder and firewood are mainly done by women and children.

Fruits of Labour

"Managing a CPR needs hard labour during the initial two years. It has been three years since we started transplanting trees in this land. Trimming of the branches is the only work that we do at present. New seedlings of trees, especially neem trees, are coming out now automatically from the fallen seeds. Once barren surface soil has also turned to grassland grazed by cattle. It has become our favourite place for passing afternoon leisure time."

Tapasi Bera, Ramganga village, South 24 Paraganas, Sunderbans.

At the same time this model has a number of financial, ecological, social, and empowering advantages for women in the long-term. It gives women economic freedom with minimal financial investment, though lots of investment of manual labour. In many places women have started selling saplings to augment their group fund. Women easily access fodder and firewood. They also upgrade their skills of raising tree saplings, managing the commons and interacting with local governance bodies. On the flip side, women's labour time and workload increases and they are still not part of the governance institutions which decide whether a CPR can be used by the community or not. CPRs are very helpful for landless women farmers as they can access firewood and fodder from these common areas and take up livestock management.

Policy Options

Village development plans should also include CPR Management and allocate funds for this. Government's social forestry projects can involve villager in developing areas on the lines of CPRs and management of these can be give to local villagers with high involvement of women. Several public and private enterprises, take up social forestry as part of their Corporate Social Responsibility mandate. They can work with women groups/NGOs to manage these areas in a manner where they can use products and maintain the greenery. These areas can be leased to groups of landless women and of women in urban slums for this purpose. The state forest department and other departments need to promote a community-led model to make appropriate use of fallow lands alongside roads, embankments, football grounds, rail yards, wetlands, etc. The MGNREGA lends itself to this model and promotes gram sabhas and panchayats to take ownership of the commons to secure the livelihoods of its people.

Each state government must promote use of MGNREGA provisions for CPR management from the village planning process upwards. CPRs need to be part of village development plans and municipality plans in urban areas. The plans need to incorporate use of CPRs to ensure income and empowerment to asset-less women. this will include land lease, access to credit and other inputs, capacity building and taking up of decision-making roles. In rural areas, this will also help strengthening the panchayat system itself. This intervention requires minimum investment by the State and can be widely extended with the help of non-governmental organizations and community groups.

Further reading

1. Resource organisation: DRCSC <http://www.drcsc.org>.

6. ‘Nutrition gardening’ can tackle malnutrition, poverty

In the last few years, malnutrition among the small and marginal farmer families in the Sunderbans, West Bengal, has further deteriorated. This has followed more frequent climate change-induced disasters like floods and cyclones which have destroyed acres of cropland.

Small and marginal farmers, especially women took up cropping of multiple food crops on the small plots around their homes to ensure them food and nutritional security through the year. Both in West Bengal and in the floodplains of Gorakhpur, East Uttar Pradesh, women farmers used their small front yard and/or backyard to grow different kinds of grains, pulses, vegetables and fruits through intercropping and crop rotation. Around 15-20 varieties of crops, including leafy and other vegetables, legumes, roots and tubers, spices and herbs, are grown in these gardens throughout the year. The different food crops fix soil nutrients. In the Sunderbans, these gardens also conserve sweet water in the fields because they are grown on rows of small mounds or hills. The saline flood waters run off these sloppy mounds, leaving sweet rain water to irrigate the crops and seep into the soil. The success of the model lies in its utility for even landless and marginal women farmers who are able to use the land around their house for these ‘nutrition gardens,’ as they are called in West Bengal. The ‘nutrition’ gardens, say locals, are a more sophisticated form of the traditional kitchen gardens tended by women. They are also innovative as women grow vegetables in pots, discarded tubs and mounds of soil on the ground.

Hope vs Hard Work

“Vermi-compsot is the best fertilizer but its preparation needs a lot of hard work. I cannot explain to you how disheartening it was when all my vermin-compost got damaged last year due to lack of a good quality storage chamber. We do not have money for buying a proper box to store the compost. Only the government can help us all by providing such boxes but we don’t know if we can get them, or if the government at all supplies them!”

Pushpa Gayen, Kulermath village, Hingalganj block, district North 24 Paraganas, West Bengal

It’s a lot of hard work but it gives my family fresh vegetables every day so its worth it. I have to put in most of the labour. My sons and husband sometimes help me. Last year I got 6 quintal production and earned about Rs 2500 in the entire year. This was my income and I could spend it in anyway I wanted. With the help of a local organization, I am now a trainer for local women farmers here. This is a very good way to survive our flood seasons and it keeps our soil fertile.

Ramrati Devi, village Sarpatah, block Campierganj, district Gorakhpur, Uttar Pradesh

Gender lens

More than 250 women farmers in districts North and South 24 Paraganas in the Sunderbans are currently practicing nutrition gardening. In both the Sunderbans and in Gorakhpur, most of the activities are done by women with men sharing part of the work in

tending to the nutrition gardens. Women feel empowered because the gardens help them regain food and nutrition security for their families. They usually sell the excess vegetables in local markets and keep the income earned. Yet, women say their day never ends because different vegetables have different growing cycles. So every day some crop or the other needs watering, unlike farm crops which require irrigation only at critical periods in their growth cycle. Again, almost every day they have to apply some herbicide or cut or pluck some vegetable. And of course, women often don't own the nutrition gardens they labour on so larger decisions are still taken by the men.

Policy options

The government must ensure food and nutrition security at the household level by giving women ownership of homestead land through incentives such as lower property taxes, priority credit and lower interest rates on loans taken against the homesteads. Agriculture extension work must prioritise nutrition gardens and provide assistance in the form of seeds, manure and other inputs, including provision of simple, low-cost labour-saving devices. Drudgery reduction must be prioritized with interventions like training and loans for group compost making. These interventions would go a long way in encouraging the increasing number of women agricultural labourers to grow food for their families around their homes.

Several existing schemes can benefit small and marginal women adopt this model. For example, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) guidelines already promote production of the labour-intensive vermin-compost through women's groups. Under MGNREGA, land development, construction of water harvesting structures and preparation of liquid manure can also be undertaken on homestead land owned by women. In other words, utilizing MNREGA funds for the above purposes must be counted as man-days invested by women farmers. Similarly, the National Horticulture Mission (NHM) has provisions such as the establishment of new gardens and organic farming but the focus is on large areas and industrial horticulture. The scope of NHM must be enlarged to include provision of assistance to nutrition gardens of small/marginal farmers and landless women labourers for home consumption and earning incomes. Significantly, while most of the vegetables and fruits are grown in rural areas, the consumption of these is higher in urban areas, leading to high malnutrition for rural people, especially women.

ATMA provides for farmer-to-farmer training and, together with MGNREGA, training and inputs needs must focus on vegetable gardens. Nutrition gardens, critical to tackle malnourishment in India, must be made part of LAPAs - the Local Action Plans on Adaptation – as integral to every village development plant. LAPAs can also be operationalised in urban areas as part of city plans where poor women can have nutrition gardens in and around their homes, even in urban slums.

Further reading:

1. Resource organisations: GEAG (http://www.geagindia.org/) and DRCSC (www.drcsc.org)
2. Ministry of Rural Development, July 2013, Building Sustainable Livelihoods of the poor through MGNREGA: Users' Manual, Government of India, New Delhi. Available at: http://nrega.nic.in/netnrega/WriteReaddata/Circulars/MGNREGA_manualjuly.pdf

7. Rainwater harvesting and water management reduces drudgery

Uttarakhand: Abode of all rivers, the hilly regions of Uttarakhand are nevertheless beset by water scarcity. Villagers in districts Almora and Nainital are taking up roof rainwater harvesting with the help of a local organisation. Climate change, with erratic rainfall, higher temperatures, delayed snowfall and early drying of ponds, has further aggravated the problem. Rainwater harvesting has helped conserve water during monsoons for later use and also controlled soil erosion. Till now, about 200 roof rainwater harvesting tanks have been established for collecting rain water. The concept of polyline tanks was introduced in 2003. These tanks are cost effective and, if established properly, are more durable than stone masonry tanks.

In addition, since 2008, natural earthen ponds, micro-reservoirs, of different sizes have been created in 30 villages. These are playing significant role in water recharging of down springs and also reducing soil erosion during rains. The ponds are also retaining moisture in the surroundings for optimum growth of plants and fodder. Over four years, this activity has recharged the downhill mountain springs and streams from which villagers get their drinking water.

West Bengal: The Chhotonagpur range in the western region of West Bengal gets rain only for 2 months and faces drought the rest of the year. The soil on this undulated topography is rocky lateritic with very low water retention capacity. Excavation of ponds is difficult and expensive because the rocks are almost impenetrable. So the ponds are usually very shallow and, after the monsoons, cannot hold water till next summer. Wells also dry up in summer. Women have to spend 5 hours walking 5 Km daily to get water for their daily needs. Farmers are able to grow only one crop annually in this semi-arid region so there is large-scale distress migration by men who go away at least for 6 months to earn elsewhere. The West Bengal State Action Plan on Climate Change says rainfall is expected to decrease in this region.

Small and marginal farmers have been organized into five-member groups by a local organization, Development Research Communication and Services Centre (DRCSC), to excavate old ponds and create new ones. The ponds are built with broad 3-4 steps round the circumference so that as water receds, farmers could grow vegetables on the steps and use the water for irrigation. Trellises made over the banks are used to support the creeper varieties of vegetables.

Fruits are also grown on the banks. Trenches dug from the ponds take the run-off to adjacent fallow plots where 40 different vegetables are grown. Fish are also reared in the pond for additional income.

Gender Lens

Together, these water harvesting bodies fulfil all the household water requirements, including making water available for livelihoods. The time saved due to availability of water at the doorstep is used in other productive activities such as growing cash crops in Uttarakhand and mixed farming in West Bengal. This initiative also reduces the drudgery of women for they don't have to walk miles and spend hours to fetch water every day. Water helps them grow fodder and fuelwood trees around their homes. Water harvesting has helped reduce out-migration by able-bodied men.

Access to water benefits the family but women put in more time and labour than men in growing fruits and vegetables. In West Bengal, women also do inland fishing on the land around their home by making a small pond. Yet, women do not have access to financial resources to fund these activities. Access to credit remains easier for men. Women are rarely active members of local Panchayats and so are unable to source benefits like seeds, manure from government schemes. Women do not own land on which they work and so cannot always decide the mix of crops or resilient strategies to adopt unless their spouses also agree with what they want to do.

Policy Options

Gram Panchayats must include rainwater harvesting structures as adaptive measures in their village development plans. Panchayats can also motivate women self-help groups to take up this activity by providing financial and technical assistance and seeds and other inputs to small and marginal women farmers and agricultural labourers. The latter can make water sources around their homes and also grow food crops in their yards. Gram Panchayats must also promote giving ownership rights or long leases over water harvested ponds to women's groups so that the latter can manage them well. Common property resources must also be utilized for water harvesting by gram panchayats.

Roof rainwater harvesting structures must be made mandatory and provided for as part of the funds given to poor women to build their house under the government's Indira Awas Yojana. Agricultural loans can earmark a portion of the loan for rainwater harvesting structures to ensure that farmers have water to irrigate their land and can pay the loan back. Women's groups should be given these loans on priority basis and as part of the Central government's Financial Inclusion initiative.

Further Reading

1. Resource organisations: CHEA (www.cheaindia.org) and DRCSC (www.drcsc.org)

8. Better livestock management in hills helps women farmers

Women farmers, including landless women, rear livestock for food and income security. Livestock is an asset they often own, manage and control. Yet, getting fodder and water has always been difficult for hill women. Human-induced and climate change-led destruction of forests, soil erosion, depletion of perennial streams and erratic rainfall has made the situation worse. In the hills, livestock is particularly important because landholdings are small, fragmented and decreasing and women are the main farm workers. Livestock is a critical additional source of livelihood for farmer families. Livestock waste is also used as manure for growing crops on the small landholdings as hill farming is based almost entirely on natural inputs.

Livestock rearing can be a profitable means of livelihoods with high yielding varieties of livestock and assurance of fodder and water for them. Such an initiative is underway in over 15 villages in Lamgarah block in Almora district. The improved breed given to women farmers by a local organization is yielding high milk yields. Efforts are on to promote and motivate villagers to adopt artificial insemination in local breeds from the semen of improved varieties. This can be done at minimal cost. This initiative has led to fewer cattle heads giving enough milk for women to sell it locally and for their menfolk to sell it commercially. Fodder banks have been developed in Van Panchayats, or village forests, which are being rejuvenated by the Van Panchayat committees where a third of the members are women. Fodder is also being grown on the borders of the hill terrace farms among 700 families.

> "Preparing fodders for poultry, feeding them, maintaining their chamber, managing domestic animals, providing water and cleaning them are entirely my task. Livestock rearing is necessary for our survival but nobody really cares about the increasing hard labour we (women) are investing in."
>
> Swapna Mondal, Kulermath village, Hingalganj block, district North 24 Paraganas, West Bengal

> "Government should give more thrust on development of animal husbandry. Otherwise, where will we get organic fertilizer or compost?"
>
> Ramrati Devi, village Sarpatah, block Campierganj, district

Gender Lens

This intervention has reduced the workload on women as earlier they spent all their time fetching water and fodder from afar or taking cattle out grazing. Now, women get fodder from around their homes and stall feed the cattle. The time saved is spent on learning new skills. Women's income from livestock rearing has gone up. However, wider market linkages are still made by men as cultural norms continue to restrict women's mobility and freedom to interact in public

spaces like markets. Within homes, however, women do now have a larger say in decisions regarding livestock rearing and management. Women are also better informed about livestock management following opportunities to attend trainings and take part in exposures visits. Since this programme works more closely with women because livestock rearing is primarily women's work, the village men are reluctant to participate or even encourage this programme. Women traditionally have less access to funds and need the support of men to invest better in improved breeds and fodder production.

Policy Options

This programme can be promoted by ATMA and National Rural Livelihoods Mission through existing women's cooperatives, women SHGs. Panchayats can promote this scheme with individual women as part of a rural entrepreneurship. These programmes will give women access to financial and other inputs for livestock m and linked to credits and savings. Panchayats can promote this scheme as a self-sustaining business plan, giving incentives to develop women entrepreneurs and give support for the initial technology, fodder seeds, training and other inputs. Panchayats/block offices can also provide livestock and fodder to women farmers and women agriculture labour.

Further Reading

Resource organisation: Central Himalayan Environment Association, CHEA (www.cheaindia.org)

9. Integrated Farming promotes traditional knowledge and climate resilience

Uttar Pradesh & West Bengal:

An overwhelming 85% Indian farmers are small (1-2 ha of land) and marginal (less than 1 ha of land) and increasingly women. For these farmers, industrial mono-cropping with its high inputs and accessing large-scale government loans or schemes is not viable. What works for these small and marginal farmers is integrated farming, carried out in different geographical regions in different ways. With the increase in natural disasters, innovative use of these small lands and crop production has helped tide farmers through emergency times. In West Bengal, one such innovative method is called land shaping and in eastern Uttar Pradesh it's called 'machaan' or multi-level cropping. Both kinds create different levels for sowing different crops on a small piece of land and include a variety of food and cash crops.

Farmers grow crops ranging from grains to vegetables and herbs, plant fodder trees, rear poultry other livestock and even fish. In the Sunderbans, fish raising and poultry is integrated by digging a small pond on a patch of the farmland to grow fish; poultry is raised in enclosed cages or, inte flood-prone areas, on a raised wooden platform above the pond. In Sunderbans, Labout 50% of the land is used to grow paddy and vegetables, 20% for fish, 15% for rearing cattle and poultry and the rest 15% for cultivation of fodder. In eastern Uttar Pradesh, two methods are followed. One is the multi-level cropping on the same piece of land and another is integrated farming with a pond and a raised platform for poultry with fodder and fruit trees grown on the banks of the pond and grain and food crops on the rest of the land.

Integrated farming allows diversification of crops which puts in place a network of soil nutrients flow, imparts stability in production and gives food and economic security during climate fluctuations. If one crop fails, the others survives. If all crops are damaged, people still have fish, milk, eggs, and poultry animals for survival. Organic farm wastes, crop residues, animal urine and dung, etc. are recycled and reused as compost, farm-yard manure, vermi-compost, *matka khaad, NADEP*, etc.

In Sunderbans, integrated farming is resilient to increasing soil salinity. Part of the land is excavated and the soil extracted is piled on another portion of land where paddy is grown. Fresh rain waters wash away the salinity in the top soil into the pond below where saline fish are reared. On the raised land, salinity is thus replaced with fresh water. Traditional saline-resilient paddy varieties are able to survive well in the soil salinity below. The fish pond is linked to trenches across the farm so that fish have more room to swim and spawn. Varieties of vegetables, fruit and fuel trees, medicinal plants are grown on raised soil mounds with furrows in-between where again, fresh rainwaters wash away the salinity into the furrows and from there into the narrow trenches or fish channels.

In Gorakhpur district in eastern Uttar Pradesh, small farmers grow multi-layered crops on the same piece of land so that in case the floods wash away lower height crops, at least those growing at a higher level are saved.

Gender lens:

Integrated farming provides additional income for the family and is especially useful for the nutritional security of women and children. However, integrated farming has increased women's share of time and labour compared to men. This is because in conventional farming, male farmers purchase the chemical inputs but in integrated farming systems, women collect cow dung, domestic organic waste, husk, etc, store them in chambers and then prepare farmyard manure or vermin-compost. Integrated farming combines farming with animal husbandry, poultry and fisheries, the latter three predominantly being a woman's responsibility. Thus, integrated farming increases women's workload. Almost 75% of the activities involved in integrated farming are contributed by women.

> "Ponds – excavated under the land shaping of integrated farming – are really very helpful. From the fisheries we are now getting our own household fish requirements and also could earn some money by selling fishes in the market. Earlier we had to go to other's place to collect water for cooking, washing utensils, domestic animals and also for cultivation. Now water is there in our own house, so it reduces some of our workload"
>
> Anjali Munda, Nebukhali village, Patharpratima block, district N 24 Pgs, West Bengal

> "Now we are getting more than one crop from a single plot. It is economically profitable for us. Earlier some parts of our lands used to be wasted, but now each portion is being cultivated in integrated farming system."
>
> Ramesh Kumar Mistry, Kanaknagar village, Sunderbans, district N 24 Pgs, West Bengal

Yet, women are not considered farmers in their own right because they do not own land and so cannot access credit, technology and other inputs through government schemes. For example, women do not own Kisan Credit Cards to be able to access credit though on paper these can be owned by landless agricultural labour. Crop insurance too accrues only to landowners, majority of whom are men. Livestock, essential for integrated farming, is not promoted on a large scale though it would help women. Seeds, manure, herbicides and other inputs required for integrated farming are not available from panchayats and block-level offices or from government shops.

Where these are available, women are not able to access these because of limited knowledge, restricted mobility or lack of funds. A resilient farming system where women can be knowledge leaders and managers is not given priority by the country's agriculture infrastructure.

Policy options

Development of Integrated Farming System has been included as new interventions under technologies and practices category of National Mission for Sustainable Agriculture but unfortunately women farmers' issues remain unaddressed. Practicing integrated farming is expensive for a small/marginal farmer as the initial land-shaping needs money. Women-headed households and women who do not own land will find it impossible to get credit to do this task. The idea of land-shaping and bunds around flood-prone fields could be integrated into Mahatma Gandhi National Rural Employment Guarantee Scheme (MNREGA) with its existing provisions, like, excavating new ponds and renovating traditional waterbodies. Sampoorna Grameen Rozgar Yojana (SGRY) too offers social forestry, agri-horticulture and pond excavation/re-excavation with primary support for pisciculture on private lands and can help farmers grow multi-level canopies of vegetation.

Further reading

1. Resource organisation: GEAG (www.geagindia.org) and DRCSC (www.drcsc.org)
2. National Mission for Sustainable Agriculture Guidelines 2014 http://agricoop.nic.in/imagedefault/whatsnew/nmsagidelines.pdf
3. Government Programme: MNREGA: www.nrega.nic.in
4. Government Programme: RKVY: www.rkvy.nic.in