ecovillage

Next Generation Low Carbon, Climate Resilient Eco-village Development in South Asia District

Small Yet Impactful Technologies in EVD-Baskets

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Capacity building training to Bhalumara Namuna Krishi Samuha on Financial Management and Auditing.

Project Beneficiary Perception

Meet Ashok Muktan, a prominent resident of Bhalumara-3 within the Marin Rural Municipality, and also the chairman of the Project Beneficiary Committee. This committee comprises 11 women and 14 men, all selected by the community itself. Their collective mission: to lead a transformative project at the grassroots level, to elevate the quality of life for their community members significantly.

The committee's mission revolves around three key responsibilities: facilitating seamless communication and collaboration with project beneficiaries to align the initiative with community aspirations; procuring eco-solutions and Renewable Energy Technologies (RETs) through careful vendor selection and contract negotiations to ensure quality and sustainability; and monitoring and evaluating the installation of eco-solutions and RETs, promptly addressing any challenges to ensure the project's successful local execution, ultimately improving the community's quality of life.

Ashok Moktan, the Chairman of the Project Beneficiary Committee, enthusiastically reports a substantial improvement in the quality of life within the community following the successful implementation of the project. He highlights that the project has not only imparted invaluable skills to the villagers but has also introduced

technologies that have significantly enhanced their irrigation systems. This newfound technological advancement has, in turn, inspired the villagers to take steps towards commercialising their agriculture practices, marking a notable shift in their livelihoods and demonstrating the tangible positive impact of the project on the community's well-being.

Ashok's ambitious vision for Bhalumara consists of three key plans set to be implemented in the near future:

Waste management

1. The Institutionalization of Bhalumara Model Agriculture Group:

Ashok's first step is to continue institutionalising the Bhalumara Model Agriculture Group with regular financial audit and PAN registration renewal.This move will provide a solid foundation for the group's activities, ensuring their long-term stability and impact in the community.

2. Revenue Generation through portable Solar Pump:

The income generated by the portable solar pump will be channelled back into the group's operation and management along with needs and projects, further enhancing their capacity to make a positive difference to its members.

3. Commercialising Tapari Production from Sal Leaves:

Ashok plans to commercialise the production of Tapari made from Sal leaves by utilising the community's natural resources and craftsmanship. Ashok also wishes to appoint a dedicated person through community engagement to manage and oversee the Tapari production. Climatic zone of Bhalumara village fosters the abundant availability of Sal trees.

With proper planning, collaboration, and dedication, these plans have the potential to transform Bhalumara into a thriving and sustainable community of agriculture, renewable energy, and traditional craftsmanship. The future looks promising for Bhalumara.

Improved Cook stoves meeting the rural cooking demands

Chini Maya Lo, is a dedicated farmer by occupation. When the project faced her with a choice that promised both environmental and personal benefits, she embraced a clean cooking solution – the one-pot Improved Cook Stove (ICS) – leaving behind her traditional cooking stove.

Chini Maya reports,*"The traditional stove, had, over time, become a source of indoor air pollution (IAP). It also demanded a relentless supply of fuelwood, pushing me to regularly gather more wood as I am also involved in animal husbandry and need to cook feedstock on a regular basis. I enjoy cooking Selroti in the Maitribhumi cookstove. With the ICS, there's no risk of burns. It is especially useful in winter as it provides warmth alongside clean cooking"*

China Maya cooking Dhindo (ढिंडो), (Cornmeal Porridge)

The moment Chini Maya made the switch to the ICS, she noticed a remarkable transformation in her daily routine. The ICS significantly reduced indoor air pollution. With its efficient design, she found herself consuming less than half the fuelwood she once did, lightening the burden of constant wood collection.

Shuku Maya Lo, who runs a grocery shop, exclaims in happiness, *"this is one of the best things available at my home. It has lightened my drudgery, on one hand I can cook both rice and curry at the same time and my expenses to purchase fuelwood has reduced three times. I have been able to spare some time from the kitchen and get myself involved in kitchen gardening. The project also supported me with training on vegetable farming and polytunnel house".*

While the task of igniting the Improved Cook Stove (ICS) may occasionally present a challenge, Shuku Maya remains content with their decision to embrace this clean cooking solution. She wholeheartedly encourages her fellow villagers to consider upgrading their cooking stoves, inspiring them to explore the possibilities of cleaner air, reduced fuelwood consumption, and a safer cooking environment. Consequently, 14 additional demand of ICS was created after the first phase of ICS installation at 50 households.

With comprehensive training on chimney maintenance, the ICS users diligently clean their chimney once a month, ensuring it operates at peak efficiency. In addition to the chimney upkeep, users regularly coat the ICS with a mud-water slurry mixture.

Comparison table

Parameters	Traditional Stoves	Improved Cookstove
Wood consumption	2.7 kg/ person	1.4 kg/ person
Thermal Efficiency	7-15%	27-29%
PM2.5	5360 ug/m^3	295 ug/m^3
CO	59 ppm	3.6 ppm

Waste Management

Before 1- Traditional chulo efficiency 13%

Before 2- Open chulo efficiency 10%

Now 1- efficiency 27%

Now 2- efficiency 29%

The introduction of individual dustbins for every household within the community has shown remarkable transformation in the way waste is managed. This simple yet effective initiative has yielded improvements in waste disposal practices, resulting in a cleaner and more sustainable environment. The orientation on waste management was provided to school students for their involvement in environmental conservation and climate actions since early childhood.

Susmita Rapal, a 15 years old, grade 8 student has oriented her family members and neighbours to segregate the waste. She says,*"Before the dust-bin program at each household, me including my neighbours used to leave small plastic wrappers on the street and other bigger inorganic waste were thrown on the Marin river. Now the organic wastes are decomposed in a pit and the inorganic waste are collected in the dustbin. My waste mostly consists of food packaging plastics."*

Families now utilise these dustbins to gather unwanted items, particularly non-degradable, which are subsequently collected weekly from each household by the Municipality and disposed of at designated landfill far away from the settlement. This structured approach to waste

Waste management

disposal has not only reduced clutter within and premises of households but has also significantly minimised the litter in the community's streets.

Households collect these organic materials and use them to produce nutrient-rich compost. This compost is a valuable resource, enriching their farmlands and promoting sustainable agriculture practices.

Induction

Dolma Maya Waiba's household consists of a versatile array of stoves which includes an LPG stove, an improved cookstove, and a modern induction stove. With this diverse lineup, Dolma can effortlessly adapt to her daily cooking needs.

However, the star of her kitchen, as of late, has been the induction stove. Its efficiency and precision have allowed her family to not only enjoy delicious meals but also realise significant cost savings. Dolma reveals that the induction stove has led to a remarkable reduction in the consumption of both LPG gas and fuelwood. In her own words, she exclaims, *"The LPG gas used to last me only three months before, but now it lasts at least six months. In addition there has only been a raise of about Rs. 150 in my electricity bills with the use of induction".*

Among the positive changes noted,

Male participating in kitchen after the installation of e-Cookstove.

one particular shift was the increased participation of husbands in the kitchen.With the induction stove's efficient performance and cleanliness, it appears to have broken down social stigma and made cooking more accessible and enjoyable for all members of the family. Dolma happily reports that her husband has been more eager to contribute to the cooking in their home.

While promoting induction cooking within the community, households eager to adopt this modern cooking technology were thoughtfully equipped with an induction cooker, a 5 lt pressure cooker and a sauce pan. One member of the community, an avid user of the induction stove, expressed a minor dissatisfaction with the equipment provided, they remarked, "I wish the pan was a bit deeper."

From cost savings on energy sources to a reduction in environmental impact, and even the promotion of more inclusive cooking practices, the induction stove has proven itself to be a welcome addition to households of Bhalumara.

Cowshed Management to Improve Sanitation

Purna Lo, 58 years old, shares his home with his children and grandchildren. The family makes a livelihood out of farming and animal husbandry. His house consists of a self-built shed where he raises buffaloes.

Purna's curiosity piqued when he first heard about the upcoming project in his community, wondering if it could offer some much-needed assistance to his family, who were deeply involved in animal husbandry. As discussions unfolded with the project team, it became evident that his family was grappling with a persistent issue – the cleanliness of their animal shed. This seemingly small problem was having significant repercussions, as their buffaloes were falling prey to troublesome infections.

Upon learning of Purna's predicament, the project team wasted no time in providing him with vital knowledge and essential materials, including cement, to renovate the shed. They ingeniously revamped the shed by sloping the floor, allowing urine and other waste to flow seamlessly into a gutter, thereby mitigating health risks.

Unmanaged cow shed

Purna Lo participating to renovate his cowshed

In their quest to enhance overall hygiene and comfort, the family went a step further by constructing a dedicated feeding area.

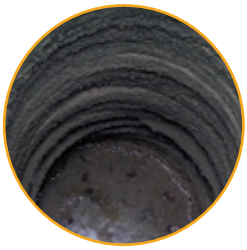
Purna recalls, *"In the past, our cowshed was a chaotic mess, a nightmare to clean. Urine would seep into the fodder, making it tedious to collect. Hygiene was a constant battle. However, since we improved our shed, the urine now effortlessly channels into the gutter and collects in a tank. The fodder remains in its designated space, reducing clutter inside the shed. My daily toil has significantly lessened, and I can even put the collected urine to good use on my farmland."*

Daily, approximately two litres of urine are now collected from the two buffaloes, neatly stored in the collection tank.

Well Repair

Jit Bahadur Lo remarks that the significance of repairing the wells goes beyond just personal convenience; it has become a positive transformation for the entire neighbourhood. He adds,*"People say it's climate change that this year the monsoon was delayed as well as not active enough for paddy plantation. Luckily the wells were deepend before the paddy plantation season. Water was pumped to the fields of 9 user households of this particular well. Sadly, we sowed maize last year but could not harvest itr because of prolonged drought. Had the well been rehabilitated earlier, we could have maize production as well".*

Previously, the wells in the area had fallen into disrepair, resulting in critical water shortages that affected both irrigation and drinking water supplies. Recognizing the urgent need for action, the project, in



Dried water well during dry season

Adding rings in the well of Bich Tole (बीच टोलको इनार)

Jit Bahadur with his irrigated paddy field on background

collaboration with the beneficiaries, embarked on a restoration mission. The community received essential materials such as rings and cement to carry out these repairs.

The process involved digging deeper into the ground until significant water recharge was rediscovered, addition of rings, PCC of the walls and area around the well and increasing the height to a safe level.

Six community wells were renovated. Now, with the wells fully operational, the community can rely on them as a dependable source of irrigation, even during droughts. This transformation has not only safeguarded their livelihoods but has also restored hope in times of water scarcity.

Water-Energy-Food Nexus in EVD: Portable Solar Pump and Sand-Cement-Soil Pond

Irrigation has forever posed a challenge for the farmers of Bhalumara. The arduous task of lugging heavy buckets of water across vast distances from the wells to their fields had been their daily toil.

When the project introduced the community to portable solar pumps, a wave of excitement swept through the village.

These portable solar pumps harness the power of the sun to effortlessly draw water from the wells using a motor, greatly enhancing the accessibility of this resource to the fields. The motor pumps the water

into long pipes that can reach the fields with no issues.

These lightweight, portable solar pumps can be wielded with ease by both men and women. No more heavy lifting, no more fatigue – just trouble free irrigation for Bhalumara's farming community.

Vishnu Maya has taken a step to address irrigation challenges on her farmland by constructing a sand cement pond. In her community, while there is a reliable source of drinking water, the availability of water for irrigation is limited. It takes a challenging turn in winter when there are minimal to no water resources available for agricultural irrigation.

The plastic pond has proven to be a valuable resource for Vishnu Maya, serving dual purposes for both irrigation and household needs. In addition to its role in storing water for irrigation, Vishnu Maya utilises the pond to harvest rainwater during the monsoon.Vishnu Maya was trained to strategically locate the sand-cement pond near her polytunnel, in order to ensure efficient access to water resources for her tunnel and farmland. Vishnu Maya maximises this resource by utilising the stored water from the sand cement pond to irrigate both her farmland and the polytunnel, which includes the drip irrigation system.

Portable solar pump

Sand-cement-soil pond

Grey water reclamation

Vishnu Maya shares her experience, saying,*"In the past, I relied on collecting water in a drum for irrigation, but it proved to be insufficient for my needs. Especially during the winter seasons, I faced the frustrating challenge of having very little to no water available, which in turn hindered my ability to cultivate crops throughout the year."*

Vishnu Maya also highlights an unexpected and delightful aspect of the sand cement pond. She humorously shares,*"In addition to its practical benefits, our family has found a fun side to the pond. My husband, kids, and I enjoy playfully splashing around in the water during the scorching hot days of Sindhuli. The pond's shallow depth ensures that it's safe for the children."*

Bio-fertilizers and pesticides

Babulal Lo, a dedicated farmer by trade, displayed a keen interest when the project introduced the concept of Jholmol to the community. Eager to learn on how to make the liquid fertiliser, which could also double as a pesticide, Babulal recognized the importance of transitioning to organic alternatives instead of relying on chemical pesticides and fertilisers. He understood that the long-term use of chemical agents was gradually deteriorating the quality of both his soil and crops, prompting him to take responsible action in pursuit of sustainable and environmentally friendly farming practices.

The project played a pivotal role in empowering Babulal through capacity training, enabling him to produce his own Jholmol. He shared insights into his farming journey, explaining that his previous reliance on chemical fertilisers not only had detrimental effects on his soil quality but also imposed additional financial burdens. Babulal's transformative experience became evident as he stated,*"Since I abandoned the use of chemical fertilisers and pesticides in favour of Jholmol, I witnessed a remarkable increase in tomato production. To be honest, I have not been able to completely substitute urea with organic manure."*

Moreover, he highlighted his ability to make bio-pesticides using locally available resources, such as insecticidal plants(stinging nettle,suan pepper, tobacco leaf, chinaberry leaf, lantana, needle wood leaf, neem, pepper leaf), and animal byproducts(urine), effectively reducing costs that would otherwise have been allocated to purchasing chemical fertilisers and pesticides.

The project also provided three drums, each with a capacity of 50 litres, and Effective Microorganisms (EM) for a successful manufacture of Jholmol.

Jholmol 1,2,3 drums

Jholmol

Babulal using bio-pesticide (jholmol)

Climate Smart Agriculture

Kanchi Maya has recently embarked on the path of commercial farming, employing a polytunnel with a drip irrigation system to transform her agricultural practices. Within her polytunnel, she predominantly cultivates spinach and tomatoes, subsequently selling her produce within the village. Kanchi Maya expresses her high level of satisfaction with the polytunnel, noting that the crops grown within this controlled environment demand significantly less maintenance and exhibit reduced requirements for both manure and water.

The project has equipped Kanchi Maya with essential resources and knowledge, including capacity training, as well as the necessary materials for setting up her polytunnel, such as; plastic, netting, drip irrigation components, and mulching plastic. The beneficiaries actively contributed to the project by providing support for the construction of the tunnel frame, while also sourcing bamboo and other locally available materials.

Kanchi Maya shares her experience, stating,*"Bhalumara village had a severe water crisis for a very long time. Further, the soil here does not hold water because it is sandy. Never had we imagined we could grow*

Cliate smart agriculture

Kanchi Maya using portable solar pump to lift water form newly rehabilitated well

Lal Dhoj Lo with his tomato harvest

vegetables here. When the project team told us about the commercial vegetable farming training, I hesitantly enrolled myself. However, since I introduced the polytunnel integrated with the drip irrigation system and mulching, I have grown as well as sold tomatoes, spinach, cauliflower and chilli papers. The project supported me with 1 polytunnel house, now I have expanded it to five. I have become an entrepreneur, feel empowered and my personal agency is boosted dramatically. With increased access to irrigation through grey water reclamation and portable solar pumps, I took the risk of growing potatoes and eggplants for the first time in the entire village in the area of 0.17 Acre. I have been selling eggplants for 4 months now, have already sold approximately 200kg at the normalized price of NPR 40 per kg. Apart from self-consumption I sold 500 kg of potatoes worth NPR 25,000".

Lal Dhoj Lo along with 19 farmers, practicing climate smart vegetable farming resonates similar stories with bright smiles. He shares his experience as *"as an incentive for taking commercial vegetable farming training, the project provided me with seeds of tomatoes, chili pepper, cabbage, radish and cauliflower along with plastic for poly-tunnel, net mulching plastic and drum and pipes for drip irrigation. In a season, I could produce 100 kg of tomatoes and sold 55% of it. Surprisingly, from a single plant I could harvest tomatoes for 5 months. Apart from the seeds provided, I sowed coriander, spinach and beans. It's amazing that with the interventions of climate smart agriculture technologies, vegetable farming has been successful here. I wish to take training on mushroom farming."*

DAG HH FOCUSED Activity

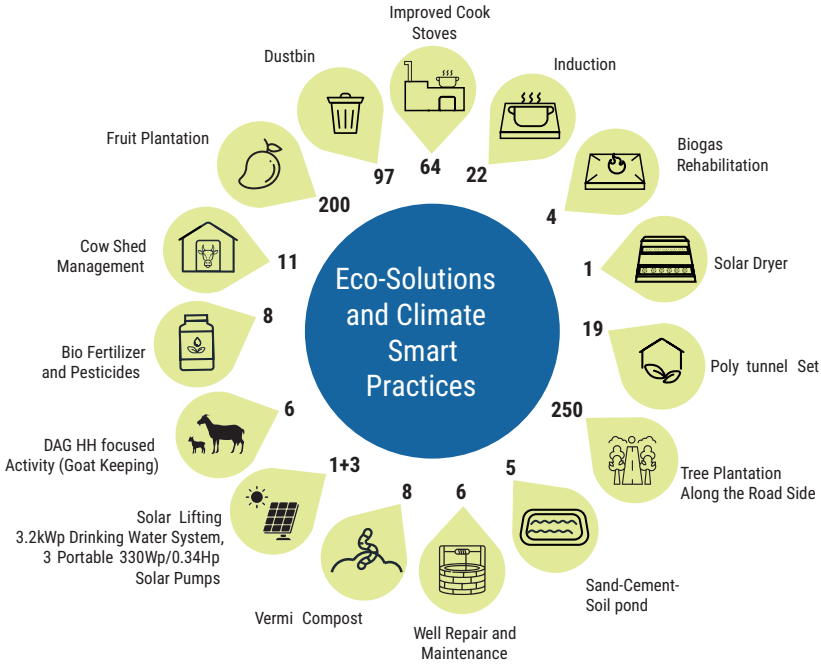
Masini Maya B.K, a dedicated farmer, now also conducts animal husbandry as her profession of choice. She is a representative of a caste that has faced economic challenges for an extended period, hindering their ability to achieve an improved quality of life. Acknowledging the Disadvantaged Group's (Dalit) circumstances, the project team discussed with six such families with income generating options. The community collectively chose goat keeping hence the project made a compassionate decision to provide them with goats to breed, with the aspiration of uplifting their standard of living. The families themselves, built goat sheds from locally available resources and paid animal insurance premiums.

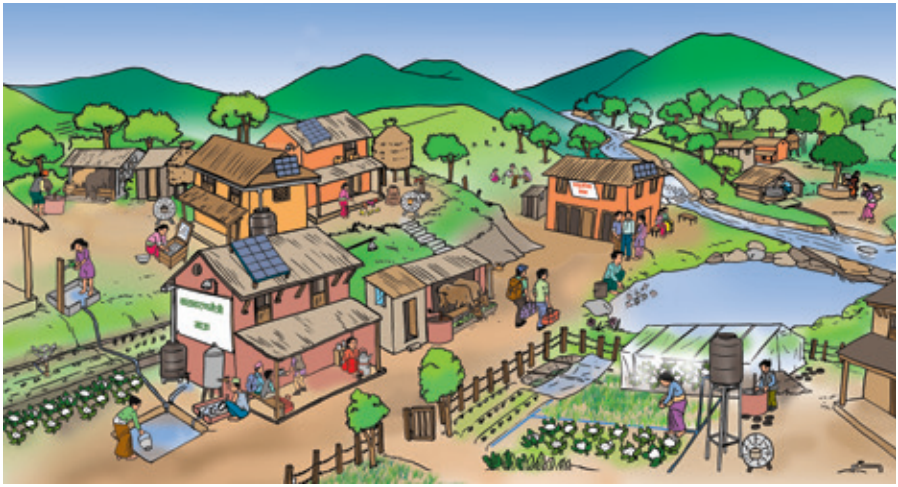
"The provision of goats has been an absolute blessing for our family," exclaims Masini Maya B.K. She goes on to explain that they used to raise pigs previously, and the costs associated with their feedstock were exorbitant hence they gave up pig husbandry . However, with the addition of goats to their household, they've discovered a more sustainable approach. The goats can readily be nourished with locally available grass from the village, eliminating the burden of additional expenses. This transformation has not only eased their financial strain but also brought newfound hope and stability to their lives.

Goat distribution to DAG women

Masini expressed her intent to sell some of her goats during the Dashain festival, aiming to generate much-needed income to cover their festive expenses.

With a sense of empowerment resonating in her voice, Masini confidently declares, *"I now stand shoulder to shoulder with my community."* Her newfound ability to contribute and thrive, thanks to the opportunities created by the project, has elevated her status within the community.


Eco-Solutions and Climate Smart Practices
Improved Cook Stoves
64
Induction
22
Biogas Rehabilitation
4
Solar Dryer
1
Poly tunnel Set
19
Tree Plantation Along the Road Side
250
Sand-Cement-Soil pond
5
Well Repair and Maintenance
6
Vermi Compost
8
Solar Lifting 3.2kWp Drinking Water System, 3 Portable 330Wp/0.34Hp Solar Pumps
1+3
DAG HH focused Activity (Goat Keeping)
6
Bio Fertilizer and Pesticides
8
Cow Shed Management
11
Fruit Plantation
200
Dustbin
97



EVD in South Asia and Partners

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