

POLICY BRIEF

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REVIVING THE DEGRADING PONDS

Strengthening climate change adaptive capacity of the small land holding farmers in lowland plains of Kapilvastu district in Nepal



SUMMARY

Climate change is an emerging threat to agriculture-based livelihoods of rainfed and small land holding farmers in Kapilvastu district. Centuries old communal ponds are in a state of degradation with reduced capacity to irrigate the land thereby eroding a marginal farmers' capacity to absorb the shock of water stress. Rehabilitation of the communal ponds with Integrated Lake Basin Management can be an effective approach to raise the resilience of pond-wetland ecosystem as a sustainable nature-based climate change adaptation measure.

Why are ponds important?

The climate of Nepal is largely influenced by South Asian monsoon, among others, that brings rains in four months (June to September). The monsoon induced rain occurs more in the east than the west of the country and accounts for nearly 80% of the total annual precipitation. The remaining 20% rain spreads over eight months with maximum occurrence just before the monsoon begins. So, in general, Nepal experiences four months of flood and eight months thereafter of droughts.

Monsoon rains affect ecosystems and food security of the people in Nepal. Therefore, the monsoon rain is the lifeline of Nepal's small land holding farmers who entirely depend on it for their food production, to ensure nutrition security and sustain livelihoods. But, studies unanimously conclude that the weakening summer monsoon and winter precipitation with disrupted patterns has been causing more harm to the small farmers' agriculture-based-livelihoods and source of food and nutrition security.

At the same time, many parts in the plain low land of Tarai Nepal, farmers have a traditional practice of using the rain runoff collected in the ponds for agricultural crops during dry spells. For example, in Kapilvastu district, ponds are of great importance as they are one of the important sources

for resilience during summer when rainfall occurs intensively in a span of less than an hour and disappear for next few weeks. In such rain fluctuations, on one hand, the ponds collect the surface runoff that prevents inundation, and on the other hand the ponds' water is used to irrigate the land in the dry days of the monsoon, particularly for paddy farming by the small landholding farmers, whose land remains outside the formal established irrigation canal network. So, the ponds have been a nature based traditional device to absorb weather shocks for small land holding farmers.

Ponds also help to maintain ground water table by keeping capillary movement intact. The improved ground water table maintains water availability in the nearby dug wells and shallow tube-wells which are the major sources of drinking water in villages. Ponds hold cultural significance when it works as an age-old support system during festivals and after-death rituals. And of course, the ponds with water are habitats for various organisms including plants, birds, fishes, reptiles and insects that maintain a scale of biodiversity in the region.

Ponds in Kapilvastu are gradually degrading.

The wetland inventory maintained by the National Lake Conservation Development Committee (NLCDC) shows there are 351 ponds in Kapilvastu district alone. They are centuries old and majority of them are commons. Pond-commons is a community property that every villager enjoys and has the right to use its services; and at the same time, it is the duty of every villager to maintain its integrity. However, our study with a focus in Yashodhara Rural Municipality of Kapilvastu district shows that the ponds are degrading.



Pond degradation is attributed to shrinkage and pollution with lack of community governance for its conservation. Siltation induced shrinkage has resulted in reduced water holding capacity of ponds; and lack of community pond governance has accelerated the situation with tragedy of commons—meaning the pond water as a shared resource is being used by the local people independently to their capacity and self-interest without due conservation mechanism in place.

Similarly, the pond water delivery practice has also changed. Just until ten years ago the local people used *dhikuli* and *bedi* to carry the pond water for irrigation and the poor households benefited most from this, now such practice has been completely replaced by the modern high capacity pumping set machines and obviously the poor are left behind.

The practice of soil mining and over harvesting of the pond water has disrupted the natural process of connecting pond water with ground water aquifer. Moreover, the capillarity movement has been hindered leading to drying of the ponds earlier.



Plastic garbage is increasingly becoming a silent nuisance in Kapilvastu. Plastic pollution can be noticed when the first big rainfall sweeps the streets and dumps the plastics in the local ponds. Because of the pollution, unlike in the past, people have even stopped using pond water for cleaning purposes in households. The water is even not safe for livestock purposes. The pond soil is so polluted that people have stopped using it for traditional household purposes such as cleansing the house for sanitation and use of traditional silo making to store the wheat and paddy.

To add further problems, as demonstrated by the Government of Nepal (GoN) study titled "Observed Climate Trend Analysis of Nepal 1971-2014", both summer and winter rain patterns over the past several decades in Kapilvastu are changing. And, the impact of change of rainfall patterns over the ponds' ecosystem is poorly understood.

Pond-dependent small land holding farmers' resilience capacity is eroding.

The small land holding farmers' capacity to absorb drought shocks largely depends on the resilience of the pond-wetland ecosystem. But the services provided by the local pond-wetland ecosystem in Kapilvastu are gradually declining. For example, if rainfall does not happen in the first fortnight of June the pond water becomes precious to irrigate the nursery bed of Normal Rice variety (Barse dhan) in the rainfed land in Kapilvastu. Further, water is a must during the different stages of rice life cycle for the rainfed land, otherwise crop failures push the rainfed farmers towards a worse state of food and nutrition insecurity.

A situation rife with degraded pond-wetland ecosystem now coupled with unpredictable rainfall patterns is also cutting the resilience confidence of small land holding farmers. Unlike a few decades ago, in Kapilvastu the annual cropping patterns of rice – wheat/lentil – fallow is shifting to rice – fallow – fallow or even in the time of drought fallow – lentil – fallow or fallow – fallow – fallow. This pattern is becoming a new normal for the small farmers whose lands are not connected with the big irrigation canals.

Too much rain-induced riverbank cutting in Kapilvastu has been on the rise as well, which is reducing small farmers into landless and dragging them towards a higher risk of vulnerability.

For the past few years harvesting practice in Kapilvastu has observed a great change with the induction of big machines that has left landless and marginal farmers devoid of seasonal labor employment. No alternative employment substitute mechanism is in practice with the local government.

On average, every second household in Kapilvastu sends a family member away to India or the Gulf for the remittance which has been an important source of resilience to the impacts of weather vagaries including drought and inundation. The interactions with the community's people reveal that more than 90% of money is spent for food purchase for survival in the hard time due to inadequate rains or untimely rains. Anemia in children and reproductive age women is very high among the households of marginal farmers which is also largely an indicator of poor resilience capacity.



Building the resilience of pond-wetland ecosystem is sustainable intervention to strengthen the adaptive capacity of small land holding farmers.

Existence of hundreds of man-made ponds for centuries in a single district of Kapilvastu is a proxy indicator to say that drought is a recurring hazard in that region. Now with a changing pattern of rainfall with climate change, conservation of those ponds has been of paramount importance; and the community living in the pond basins are unanimously demanding for pond conservation initiatives. With an objective of enabling climate adaptive capacity of rainfed small farmers, together in deep consultations with the local communities, United Mission to Nepal and a local partner, Dalit Society Development Center designed the project titled “Strengthening Community Resilience through Livelihoods and Environment Improvement (SECURE) 2019-21” which has been in operation for the past one and half years in Yashodhara Rural Municipality, Kapilvastu.



The project consists of conservation activity package for eight ponds, among others. Now those eight ponds have been rehabilitated. The rehabilitation consists of reclamation of ponds' original area, a soil cutting to increase the ponds' depth to improve the water volume, improved surface runoff inlet, improved embanking and fencing, installation of shallow tube-well to diversify the water sources of ponds to maintain the ponds' water volume even in the time of droughts, establishment and functioning of the user and stakeholder inclusive pond governance committee, and the pond committee endorsed pond rule book in place.

This package has been effective enough to contribute to raising the capacity of the pond ecosystem thereby building the resilience of the small land holding farmers in Yashodhara Rural Municipality. Farmers have used pond water during different stages of summer crops (mainly paddy) even in the time of high water stresses.

Also, people have started doing kitchen-gardening that has contributed to gaining family nutrition security in poor households. Further, the pond water has been helpful for vegetable crop diversification with at least half a dozen new vegetable crop variety added into the small family farming.

More importantly, water availability has increased the forage farming practice in communities. Its impact can be seen with an increase of meat and milk production – a key source of cash income base for the locals.

This result proves with evidence that now farmers' capacity to absorb the climate induced weather shock such as drought has increased with the help of nature-based climate change impact adaptation measures in place. Further, diversified crops resulting in increased food crop production, fresh and nutritious vegetable, diversified cash income base and a better pond governance are the sources of resilience that the improved pond-wetland ecosystem is making certain among the rainfed small landholding farmers over the time.

The local people report enthusiastically that this year their tube-wells – only source of drinking water – have not dried up. All year round availability of water in ponds might have enabled capillary motion in the pond basin areas.

Thus, the Yashodhara people's confidence even in the time of water stress has remained strong when their own natural resource become a reliable source of climate resilience.



Integrated pond management approach that integrates social, economic, environmental and technology factors proves to have been helpful to facilitate the resilience building process to the small land holding farmers.

Integrated Lake Basin Management (ILBM) is an integrated lake and pond governance tool widely adopted or adapted for the local context. It has been practiced for various lake and pond management initiatives by the Government of Nepal. For pond resilience building UMN's SECURE Project 2019-21 also applied this tool. One of the strong attributes of the ILBM is that it recommends six different pillars to build pond's resilience such as 1) institution; 2) participation; 3) policy; 4) technology; 5) information; and 6) finance.

The following table shows, in a nutshell, how the project has promoted all these six pillars with the eight ponds in Yashodhara Rural Municipality.

ILBM pillars	Integrated with pond resilience building in Yashodhara
Institution	• Pond Conservation Management Committee (PCMC) with the local government on board.
Participation	• The PCMC is inclusive in terms of gender balance, representation of diverse structure of local population. • Inclusive decision-making process is in the making with the facilitation of project staff and governance capacity building trainings.
Policy	• Pond water use guideline, five-year pond conservation management plan, strategic decisions are in place and in a functioning state.
Technology	• Shallow tube-well with renewable powered pumps have been installed that refill ponds and maintains water level.
Information	• Pond user groups and communities located in the pond basin have better awareness and education about the importance of conservation of ponds in their villages. They are in contact with the local government and like-minded organizations for assistance and support as appropriate.
Finance	• Water use levy, income from fish keeping, on-off government's financing (pledged), activity or need based cash contribution by committee members are the key sources of income to be used for pond maintenance.

The effective coordination and functioning of all these six pillars of ILBM has been much helpful to cultivate pond ownership among the local government bodies and pond users' communities. The natural link between local livelihoods and environment has been re-enforced with right management tool in place. The relationship between the stakeholders has improved to the level that government and its people work together for common objective of conserving local ponds and building climate resilience.

POLICY RECOMMENDATION

Promote planned adaptation measures by promoting traditional practice in blending with common market clean technology.

Though climate change is a recent threat to rural livelihoods, climate variability (a short-term climate difference from the usual pattern) has always been a part of nature that people have been facing and coping with for a long time. So, the people might have already established measures to adapt with the climate variability which should be considered while planning for climate adaptation measures at the local level. In this case, for example, digging shallow tube by the side of a pond and use of renewable powered machines that are easily and cheaply available in the local market is right blending between traditional practice with modern technology. Similarly, digging ponds in the highland area of riverside can be promoted for riverside farming (bagarkheti) with the use of water efficient irrigation technology such as drop irrigation and sprinklers. With sandy loamy soil abundant in the riverside the crops such as watermelon, groundnuts and pointed guards flourish well in the Banganga river side in Kapilvastu.

Effective interaction and coordination between community and local government should be established with community governance mechanism in place for the conservation of the pond-wetland ecosystem.



Ponds belong to the government while the users are local people. So, the pond governance can be ensured with right structure in place such as Pond Conservation Management Committee at the community level with involvement and stake of the local government. There should be pond management guideline including pond conservation plan. The policy framework has been much helpful to bring about interaction between the community and the local government with a common goal of conserving the ponds as a common natural resource.

Local governments should formulate and implement wetland management policy reflecting the ground context of ponds dynamics and pond-use.

At the federal level there are no dearth of policies and acts that directly or indirectly touch upon the wetland management in the country. At the same time, the Constitution of Nepal 2015 ensures devolution of wetlands management in the federal structure. So, in the context where most wetlands in Yashodhara Municipality are ponds there should be a separate wetland (ponds) management policy and action plan with the local government. Now the local government does not have any such decision and policy for wetland (ponds) management. Even for the sustainability of the newly formed and highly effective community level Pond Conservation Management Committee (PCMC) in Yashodhara Rural Municipality there should be such policy in place. The policy formulation process should be participatory involving the local people and community-based organizations with reflection on local culture, climate, environment, demography, local strengths and weaknesses.

Promote pond conservation management committee at the pond basin level with gender and social inclusive governance structure.

Yashodhara Rural Municipality is a plural society in terms of caste, cultural, religion and social practices including man-woman power relation and responsibilities. Enabling sense of common ownership over the local ponds was an objective for raising public awareness and education about the importance of local ponds with the UMN supported SECURE project. Since their formation in one and half years ago, the effectiveness of Pond Conservation Management Committee (PCMC) at eight different ponds in Yashodhara Rural Municipality has come into everyone's notice when the pond governance had an inclusiveness as a guiding principle. All the policy instruments such as water use guideline, pond conservation plan and strategic decisions on financing and group operation were formulated through inclusive governance structure of PCMC. Such practices are worth reflecting when promoting policy and practices for pond conservation elsewhere in district.

Prioritize science based pond-wetland ecosystem conservation to promote nature-based climate adaptation measures.

The hydrological cycle of pond wetland in Kapilvastu is still poorly understood in the emerging threats of climate change impacts. With the lack of community governance in place the ponds are left depleted. So, to enhance and maintain irrigation and other services of the pond-wetland ecosystem the local government including Yashodhara Municipality should plan for the studies of hydrological cycle of pond-wetland with the purpose of developing long term conservation plan and build resilience of pond-wetland thereby enabling the climate resilience of the small land holding farmers in rising trend of climate change impacts. As a campaign to promote climate resilience through nature-based solutions the provincial government can lead the initiative.

OTHER INFORMATION

About the project

Strengthening Community Resilience through Livelihoods and Environment Improvement (SECURE) is a three-year project 2019-21. With the funding support from Australian Aid and Transform Aid International (TAI) this project has been in implementation in partnership between United Mission to Nepal (UMN) and Dalit Social Development Centre (DSDC) in Yashodhara Rural Municipality of Kapilvastu, Nepal. With the goal of contributing to building adaptive communities having livelihoods resilient against climate shocks, the project promotes resilience of pond-wetland ecosystems, and increases social and economic possibilities in Yashodhara Rural Municipality.

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