



Riverbed Farming in Nepal:  
An opportunity for the landless and land-poor

LEARNING SERIES 2019/1



This publication documents the evolution of Helvetas support for riverbed farming in the Terai areas of Nepal. It builds on a review of the Riverbed Farming Project that was commissioned by Helvetas and undertaken by RIDA, Research Inputs and Development Action, under the leadership of Jeevan Raj Lohani. It also draws on case studies of riverbed farmers collected and edited by Toya Gautam and Raghunath Lamichhane.

The principle author of the current document is Hari Gurung, who has worked for Helvetas since 2003, specifically on riverbed farming since 2009, with inputs being provided by Lochana Shahi, Technical Officer - Agriculture, Innovation and Technologies, in the Riverbed Farming Programme. The document was elaborated by Dr Jane Carter, International Programme Advisor, with the support of Monitoring, Evaluation and Learning Officer, Banu Shrestha. We would like to thank all those named in the text who provided their opinions, but particularly Sudha Khadka, who championed knowledge sharing and exchange about riverbed farming in her earlier role of Programme Coordinator for Food Security and Nutrition, Helvetas Nepal. Finally, special thanks are due to all the riverbed farmers who, whether specifically named or not, have contributed to this publication through sharing their experiences.

Helvetas strives for a fairer world in which every person can fulfil his or her basic needs. We support women and men in taking charge of improving their own livelihoods in a sustainable manner and in working together as partners. Rooted in Switzerland, Helvetas is active in over 30 countries around the world. Nepal is one of the very first partner countries in which Helvetas began operations, under a 1956 agreement with the Government of Nepal.

Detailed information about the work of Helvetas in Nepal can be found at

<https://www.helvetas.org/en/nepal>

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Cover: Jitni Devi Mandal. She belongs to the Kankai Riverbed Farming Group. Photo: Flurina Rothenberger  
All photos are by Helvetas staff unless otherwise stated.

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## ACRONYMS

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CFUG	Community Forest Users Group
CTEVT	Council for Technical Education and Vocational Training
DADO	District Agriculture Development Office
LRP	Local Resource Person
MoAD	Ministry of Agriculture and Development
MoFALD	Ministry of Federal Affairs and Local Development

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## LOCAL TERMS

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Bigha	Land measurement used in the Terai equivalent to 6772.41 square metres; 1 bigha is 20 katthas.
Kattha	Land measurement used in the Terai equivalent to 338.62 square metres





Laying out the riverbed plots. Photo: Simon Opladen

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Parbati Mandal, daughter of Jitni Devi Mandal washing cucumbers. Photo: Flurina Rothenberger



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# 1. INTRODUCTION

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When rivers flowing from Nepal's Himalayan ranges reach the flat plains of the Terai, they invariably spread out into meandering channels between wider river banks. During the monsoon or annual rainy season, their waters may fill or even overflow their banks - sometimes causing extensive flooding. Following the rains, the water levels drop, and the rivers retreat to their dry season channels, leaving behind areas of sand, silt and gravel. These riverbed lands of the Terai, which often fall under the purview of local governments, have in the past generally been left uncultivated, or mined for sand or gravel. Yet if well managed, they can be farmed during the dry season to yield vegetables ready for harvest just before the annual rains recommence, when prices are high. For those who can gain access to such lands, have the necessary knowledge and skills, and are prepared to labour intensively, there is real potential for profit.

Migration into the Terai over recent generations combined with natural population growth means that there is huge demand for productive land. Many households own very little land or are landless. This is particularly the case for Kamaiyas - former slaves or bonded labourers – and the indigenous Terai peoples. For landless or land-poor households with able-bodied members, riverbed farming represents a huge opportunity to gain access to land for productive use, and thus set themselves on a path towards longer term economic security.

Riverbed farming in Nepal is generally considered to have been started by seasonally migrating Indian farmers, and dates back at least 60 or 70 years. It was essentially opportunistic - neither formalised nor scientific. Having observed the practice, Helvetas staff conceived the idea of persuading local governments, at the time Village Development Committees (VDCs) and District Development Committees (DDCs) - to lease this public land to landless or land-poor families, thus giving them a chance to grow vegetables seasonally for a fixed period. Four years was considered adequate for families to save sufficiently to invest in their own land or establish another livelihood enterprise – bearing in mind that yields and profits vary from year to year. Limited period leases also protect the owner from tenant claims to the land and allow an opportunity for further families to take a lease.

Suitable riverbeds were identified, and a trial was begun in 2006 with 670 families. In total, they cultivated 52 hectares in two districts, Kailali and Kanchanpur in far Western Nepal - now lying in State 7 under the federal system. Each household leased a maximum sized plot of 4 kattha (0.13 ha), and on average from such a plot, they managed to make an income of NRs 11,417 - approximately US \$ 175 at the exchange rate of the time. Helvetas submitted this achievement to the World Bank Development Marketplace competition and won an award in 2008. This award raised considerable interest amongst agricultural experts and donor agencies and helped finance an expansion of the scheme to 2000 households by 2011. At this point the geographical cover was expanded to include the districts of Banke and Bardiya, now part of State 5. The type of lease arrangement also expanded, covering leases for riverbed areas owned by private individuals, as well as other bodies, such as Community Forest User Groups. By 2013, 4462 landless, land-poor and severely flood affected households were being reached by the Helvetas project. In 2018, the figure was just over 7900 of whom 40% are women.

A survey (sampling 211 riverbed farming households from Jhapa, Morang, and Kanchanpur), conducted as part of a project review (RIDA, 2017) found that although 60% of the benefitting households were landless or land poor, the remainder of those surveyed owned other land. This is explained in part because of difficulty (potential social discord) of excluding land-holding families from groups formed in a given geographical area, in part because those categorised as land owners had barely productive plots (often flood-affected); and



A riverbed farmer digging a hole to plant a seedling. Photo: Narendra Shrestha

in part because some families that had taken up riverbed farming had immediately invested their vegetable-growing profits in leasing private land, or even buying riverbed land.

The story of riverbed farming is, however, not simply of a project that successfully supported certain poor households in the Terai to improve their livelihoods. The aim has been to institutionalise the approach. Thus, individuals within the communities have been trained as Local Resource Persons (LRPs) who can advise and provide technical inputs, remaining locally based after project funding has ended. Helvetas has worked closely with the government agencies involved – notably local governments (formerly VDCs and DDCs; now municipalities), and the (former) District Agriculture Development Offices (DADOs). A strong partnership has been developed with a national NGO, FORWARD, which facilitates the formation and institutional development of farmer groups, channels funding, organises trainings (increasingly giving them rather than simply providing logistical support), and collects basic monitoring data. Agricultural colleges and training institutions have been encouraged to include riverbed farming in their curricula. This includes the CTEVT, Council for Technical Education and Vocational Training, which has developed a training curriculum for riverbed farming technicians. Finally, Helvetas has also contributed to national policy development on riverbed farming.

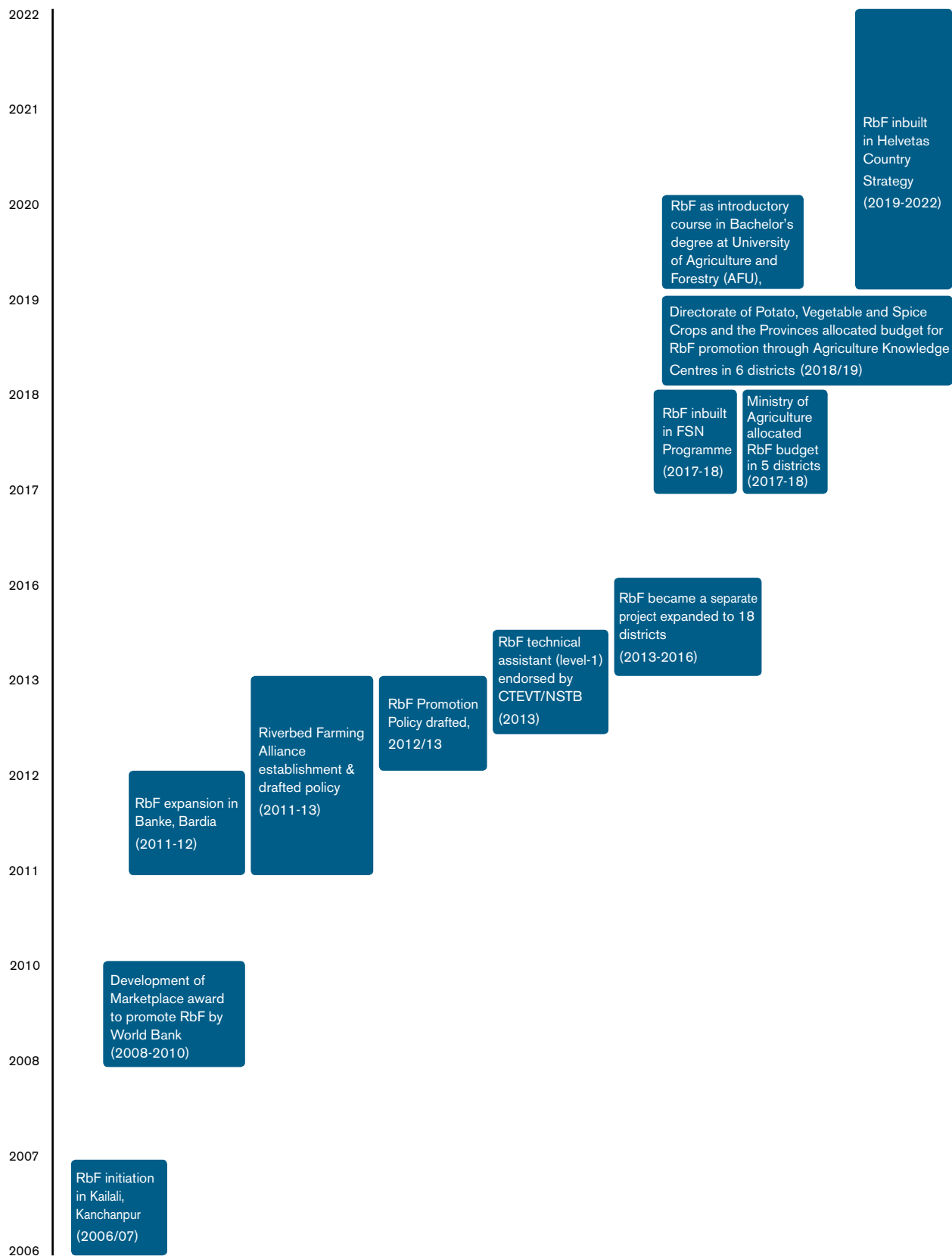


Although Helvetas was the first external agency to support riverbed farming, others have “crowded in”, especially following the early positive publicity from the World Bank award. As a result, the Riverbed Farming Alliance was formed in 2011 to promote national-level awareness of riverbed farming. Helvetas is one of six current members of this alliance, which, working in collaboration with the then Ministry of Federal Affairs and Local Government (MoFALD) was able to draft a Local Riverbed Farming Promotion Policy, finalised in 2012. This effort was overtaken by the process of federalisation, under which riverbed farming has effectively become the responsibility of Nepal’s 753 new rural and (urban) municipalities. Nevertheless, the draft policy remains a useful resource document that can contribute to the agricultural policy development of the relevant State and local governments (notably for States 7, 5, 2 and 1).



A riverbed farmer carrying his produce to the market. Photo: Flurina Rothenberger

# Progression of Helvetas support for Riverbed Farming Programme (2006-2019)





### Who are the landless or land poor in the Terai?

Until the 1950s, much of Nepal's Terai was covered by dense forests of *Shorea robusta* (sal) and relatively sparsely inhabited by indigenous Tharu and Madhesi populations – although both farmed using irrigation. A few indigenous tribal communities such as Santhals and Kewats also lived in the forest. Deforestation, and the eradication of malaria using DDT from the 1960s onwards, opened large swathes of valuable agricultural land. Settlement by peoples of the Pahad or middle hills was actively encouraged by the government, which also supported (with external funding) the construction of large irrigation schemes. Over the years, the Terai became a major paddy producing area, as well as an area of industrial development, due to the good transport connections and proximity to India. Tourism has also been encouraged as part of a strategy of creating and sustaining several national parks. The Terai population has boomed, and land prices have increased accordingly.

The development of the Terai has seen “winners” and “losers”. Those who have done particularly well are those who managed to secure land title when prices were still low. Those who lost, in many cases, were the original populations. Amongst the Tharus, some were unable to claim rights over land that they had once farmed and used communally, including some who were resettled during the creation of national parks. Others, notably in the Far West, formed part of a group of bonded labourers or Kamaiyas – effectively, slaves – who were only granted freedom under a government ruling in 2000. Although they were eventually allocated small plots of land, such land was of poor quality with very little productive potential.

Other groups who are often landless or land poor in the Terai are Dalits, who as traditional artisans did not farm land in earlier generations, and Madhesi Muslims. However, landlessness and land-poverty is not limited to these groups, and it is a growing trend. Access to productive land in the Terai is now highly prized, which is why riverbed farming represents an attractive opportunity.

The official identification of land-poor and landless households is conducted by the High Level Commission on Scientific Land Reform. Riverbed farming supported by Helvetas worked with households formally identified by it as landless or land-poor.



*“When I was a Kamaiya, my master used to give me loans. Now, I am the one who is giving him loans. The main factor that has brought this change in my life is riverbed farming. Nowadays, my previous master is amazed looking at my situation.”*

Jitram Chaudhary, Fulbaari Riverbed farmers group, Fulbari, Kailali



Watering seedlings immediately after planting. Photo: Simon Opladen



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## 2. ORGANISATIONAL ASPECTS OF RIVERBED FARMING

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### 2.1 Role of Helvetas

The role of Helvetas in riverbed farming has essentially been that of innovator and facilitator. In 2006, Helvetas staff approached administrative staff of what were then Village Development Committees, VDCs, with the idea of giving out riverbed plots on lease to landless and land-poor families. It was agreed to test the concept along the Mohana river. Helvetas facilitated the formation of farmer groups, and in collaboration with VDC officials, supported the drafting of a standardised group lease document and that the maximum plot size should be 4 kattha, amounting to 0.13 hectares. It was also agreed that the leases should be renewable on an annual basis, but that no family should continue leasing the same plot for more than four years. The amount charged for the lease varied by VDC but was kept to a minimal amount (some NRs 30 or approximately US \$ 0.45 per kattha per season). The households approached for the pilot phase were living close to the riverbeds, no more than 30 minutes' walk from their house, and could readily oversee their crops. Those who were illiterate were given special support to understand the terms and conditions of the lease before they gave their thumb-print.

Helvetas staff provided technical advice directly in the early years, holding training sessions with the groups, checking on progress, and offering suggestions as necessary. They also worked to expand opportunities for riverbed farming when the land concerned was owned by parties other than the local government – including Community Forest User Groups (CFUGs) and private individuals. This entailed many meetings to discuss the terms of the leases, and the responsibilities of all concerned.

Helvetas also instigated the system of Local Resource Persons (LRPs), selecting women and men recruits from amongst the most able and interested farmers. The LRPs are given a 35-day training covering matters such as seed quality and the suitability of different vegetable varieties; land preparation; watering, mulching, fertilizing and weeding; pest management; and harvesting. Marketing aspects were not originally included but were later added to the training module. As experience grew, Helvetas staff developed a manual for training LRPs that then became fully institutionalised in the national CTEVT system (see section on educational establishments, further below). There are now 147 LRPs who have been trained through Helvetas, of whom 27 are women. Despite the interest of women in riverbed farming, for practical and cultural reasons it is often difficult for them to travel far from home, which limits their availability to become LRPs.

### 2.2 Role of government authorities

Riverbed farming was developed from the outset in close collaboration with the relevant government authorities. In particular, the District Agriculture Development Offices played a significant role in supporting LRP training at Regional Agriculture Training Centres, as did the CTEVT in standardising the training.

VDC was involved in leasing public land to riverbed farming groups and also allocating some fund for riverbed farming. However, the process has been discontinued. DDC on the other hand was engaged in coordinating micro enterprise development fund which was established for funding/supporting farm (riverbed farming) and off farm-based enterprises. DDC also took a lead role in the joint monitoring of the riverbed farming and created progress, learning and sharing mechanism in the concerned districts. The project coordinated with CFUGs, which in some areas allowed land poor members to cultivate riverbed vegetables.

*"With technical support from local resource persons, riverbed farming is contributing to increasing income of landless and small farmers. However, the programme has been continued by limited farmers from limited areas. For more benefit to larger number of farmers, the programme should be integrated with local government plan. For this, previously developed riverbed farming policy should be integrated with local government policy for the benefit of larger population."*

Yogendra Ojha, District Coordination Officer, District Coordination Committee, Kailali

### 2.3 Role of the service provider

In implementing activities, Helvetas generally works through local NGO service providers. The NGO that has taken a major role in riverbed farming is FORWARD Nepal, which operates through much of the country but has its head office in Chitwan. FORWARD Nepal is also one of the members of the Riverbed Farming Alliance. In the piloting of riverbed farming, FORWARD Nepal was mainly responsible for logistical matters – facilitating farmer group formation, organising training sessions, ensuring that inputs supplied through the project reached the right people, and collecting monitoring data. As time has progressed, FORWARD Nepal has taken on a more pro-active role in promoting riverbed farming and providing advice and support through its own staff.

*"In Nepal, landless and disadvantaged families are cultivating cucurbits in flood affected sandy land along river corridor, making meaningful income. FORWARD Nepal started riverbed farming in Morang in 1999. Later in 2012, FORWARD collaborated with Helvetas to further promote riverbed farming in Morang, Jhapa, Banke, Saptari and Siraha. With FORWARD's support, farmers have started earning income ranging from NRs 25,000 to 1.2 million or approximately US \$ 227 to 10,900 per farmer. Additionally, some local government agencies have been motivated to fund riverbed farming.*

*To exchange progress, experience and learning in riverbed farming and to contribute to policy matters, a coordinated effort of different non-government development agencies led to the establishment of Riverbed Farming Alliance in 2011. As a member of the Alliance, FORWARD Nepal is also actively contributing to policy works. It, along with other members have collaborated with the University of Agriculture and Forestry to incorporate introductory course on riverbed farming in the Bachelor's curriculum. The university has agreed to engage its students of agriculture in research work on riverbed farming. FORWARD hopes to support the university to build its technical capacity in the days to come."*

Netra Pratap Sen, Executive Director, FORWARD Nepal



## 2.4 Organisation of women and men farmers

Given that riverbed farming was intended for poor households, very few inputs were expected from them beyond their labour. Early on, the groups were provided with watering cans, spades and sprayers, as well as vegetable seeds. As the concept became more widely known, they were asked to contribute to the cost of these items themselves.

In most cases, farmer groups were and are organised according to geographical location. That is, landless and land-poor households living close to a suitable riverbed (see technical aspects, below) are identified, and groups formed accordingly. As noted in the 2017 project review, this can lead to households being included that are not land-poor. In some cases, including such households is considered a pragmatic way of maintaining social harmony. However, there is also a case for tighter targeting where landlessness is especially prevalent and demand for land is high (see section 4).

Priority for leases is given, wherever possible, to women-headed households. The mini-survey conducted for the project review (RIDA, 2017) found that in 40% of the households, it was women who were primarily engaged in riverbed farming (in most of the rest, joint men and women responsibilities were reported). Given the high prevalence in the Terai of male labour out-migration to the Gulf countries and elsewhere, women are commonly left behind to care for family members – children and the elderly. These unpaid care responsibilities mean that, even if opportunities to work outside the home existed, they are unable to take them. Riverbed farming has the advantage of being broadly compatible with women's domestic duties, especially if the plot is close to the home. The timing during the day of plot preparation, watering and plant tending can be woven around other tasks, whilst the sale of vegetables is generally done "at the farm gate", so women have no need to travel to markets.

## 2.5 Role of LRPs

LRPs are conceived as community "knowledge holders" on riverbed farming – people to consult in the event of questions over fertilizer regimes, organic versus inorganic inputs, how to combat given types of pests, and similar matters. They have also been encouraged to become input suppliers, so that they can earn a living from the advice that they provide.



*"When I was chosen as the Local Resource Person, I increased my own land to do riverbed farming. Now, I employ a few people to do the farming as I get very busy myself. When I was a labourer, I used to work for others, now that people work for me, I am very happy."*

Balvir Chaudhary, Local Resource Person, Raikarbichwaa, Kanchanpur

## Ramharak Kewat, Fisherman turned Riverbed Farming LRP

Kamhariya, Rupandehi



Ramharak Kewat and his wife Sunari live close to the Dano river, and often experienced losses due to the flooding of their land. Ramharak's major occupation was fishing, but the amount of money that he made was barely adequate to bring up their three children, and they often had to resort to loans at high rates of interest.

The couple began riverbed farming four years ago. Ramharak quickly became a leader farmer and was selected to become an LRP through additional training. In this role, he is leading the riverbed farmers' group in his village and encouraging others to take up vegetable cultivation. Coming from a community that is generally shy of development interventions and has few government contacts, he is proving to be a role model in seeking outside linkages. He registered the farmers' group with what was then the District Agriculture Development Office and approached the Agricultural Development Bank to explore loan opportunities. He aims to stay well informed of opportunities and new ideas.

Ramharak and Sunari have improved their financial situation markedly through riverbed farming. They no longer need to go begging for loans and can easily manage all their household expenses. They point out that they could even afford to pay outright for the wedding of their daughter Sunita, which cost some NRs 76,000 (US \$ 690 approx.). *"Cucumbers and melons have changed our lives."*

## Janardan Mandal, a young Riverbed Farming LRP

Kankai Municipality 5, Jhapa



Janardan Mandal is only 24, but he is a very active LRP, regularly visiting and providing advice to a total of 120 households belonging to seven different riverbed farming groups (each of which farms a different river). This is a large area and number of individuals to cover. Janardan is, however, determined to do a good job. *"The fact that I get to share knowledge in my area is a matter of responsibility and pride."* He is currently studying to become a Junior Technical Assistant, JTA, at a technical institution in Jhapa, being keen to further his agricultural qualifications.

Janardan is apparently widely appreciated in his community. The chairperson of the Mandal Basti Riverbed Farmers Group, Tapankumar Mandal, comments on Janardan's selection as LRP as follows, *"He is young, he is energetic, he has the ability to explain things properly. And he also has that feeling that he wants to do something for the community. That is why we selected him. The training that he took, organised by FORWARD Nepal with support from Helvetas, has really helped us a lot. As a result, it's becoming very easy to practice riverbed farming."*



Janardan's elder brother Arun Mandal confirms the status that being a good LRP can bring. *"I am happy to see the villagers calling my brother Resource Person and that they are learning something from him. Because of this, our family's prestige has increased."*

## 2.6 Riverbed farming in educational establishments

From early in the selection and training of riverbed farming LRPs, Helvetas sought a link with the CTEVT. As the national body responsible for developing the curricula and certifying standards for different technical vocations, it was important that riverbed farming would be recognised as a specific technical specialisation. Thus, from 2013 LRPs have had the option to undergo an exam to become a certified Riverbed Farming Technical Assistant (Level 1), allowing them to apply for a government job should the opportunity arise.

One of the activities of the Riverbed Farming Alliance, once it was created, was to encourage the inclusion of riverbed farming in teaching at university level. Thus, riverbed farming is now included in the curricula of both the Agriculture and Forestry University in Rampur, Chitwan and HICAST, the Himalayan College of Agricultural Science and Technology, Purbanchal University. Tribhuvan University, Kathmandu has also recognised riverbed farming in its agricultural teaching; since 2016, undergraduates have been conducting studies on different aspects of riverbed farming for the practical part (mini-thesis) of their degree.



A local resource person guiding Kalpana Mandal and her son on riverbed farming. Photo: Flurina Rothenberger





Kalpana Mandal watering a riverbed field. Photo: Flurina Rothenberger



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## 3. TECHNICAL ASPECTS OF RIVERBED FARMING

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### 3.1 Plot management

Riverbeds can be made up of different types of deposits: silt, sand, gravel, pebbles and stones. Only silt and fine sand are suitable for cultivation, with silt being particularly desirable. The water table in the dry season must also be within 1 m depth, as otherwise it is too far for plant roots to reach once well established. Clearly until the roots reach the water table, they must be watered manually – a laborious task early in the cultivation season.

Plot preparation begins in late November or early December. Generally, plots are laid out perpendicular to the river so that all those with a plot have part adjacent to the river, and part further away. Where the water table is high, a ditch (trench) system of small irrigation channels can be dug to facilitate plant watering. More commonly, farmers are advised to dig small pits that will retain moisture longer than flat surfaces. Mulching – covering the soil with leafy branches to reduce moisture loss and eventually contribute to organic matter – is also recommended.

### 3.2 Crop selection

The most commonly recommended and grown vegetables on riverbeds are plants belonging to the cucurbit family – such as pumpkins, marrows, melons, gourds, and cucumbers. These thrive in sandy soils if properly watered and fertilized and are adapted to the searing temperatures of March through to May, when riverbeds are fully exposed to the sun. For farmers who have more experience, other crops such as tomatoes, cauliflower, cabbage, beans, aubergines and onions can be grown, although these need greater care and are more prone to pests and diseases.

The seed provided to farmers may be either open pollinated or hybrid seed, with farmers being taught the difference. Those that are open-pollinated generally breed true, so the seeds of the resulting vegetable or fruit can be kept and used the following year. Hybrid seeds need to be purchased every year. Farmers are shown how to pre-treat seeds to ensure successful germination in riverbed conditions.

Helvetas has regularly sought to introduce riverbed farmers to new and potentially interesting vegetable varieties. Most recently, orange-fleshed sweet potato has been tested (propagated by cuttings) and found to be in high demand.

### 3.3 Cultivation techniques

Yields from riverbed farming tend to be proportionate to the care and attention given to the crops. Beyond regular watering at the time of establishment, crops need nutrients. When households begin riverbed farming, they are often without livestock, so they have no access to animal dung and compost unless they purchase it or take on the care of livestock owned by others. In the absence of organic manure, the application of small amounts of chemical fertilizer (a mix of nitrogen, potassium and phosphate) is recommended, applied close to the roots of each plant. The soil of all riverbeds covered under the project were also tested for micronutrients and found lacking; therefore, a small application of mixed trace minerals is recommended. For those farmers who keep livestock, they are encouraged to collect the dung and urine as organic fertilizer. Often a few goats or a cow are the first purchase made from farming profits. Farmers are also trained in composting techniques.

Since the digging of plots is a back-breaking task, and one often performed by women, Helvetas has developed and introduced a labour-saving, “woman friendly” manual digger. The tool was designed by an engineer working in collaboration with Helvetas staff and then manufactured by a metal workshop service provider at a cost of NRs 2000 or US \$ 18 approx. per digger. Some 20 diggers have been tested by women riverbed farmers in Bara and Jhapa, who report on it favourably. The tool is estimated to reduce the amount of energy needed to dig a pit by 30 – 45% compared to traditional tools. The challenge now is to make the digger commercially viable, for which it is considered necessary to reduce the cost to NRs 1000.

*"I find the manual digger easy to use; with it I can reduce the time taken to dig a pit by one third. I find I can dig about 15 pits in one hour, which makes me independent in plot preparation. And I have more energy for other things."*

Asha Mallah, Kalika riverbed vegetable farmers group, Kalika De, Rupandehi



Digging is much easier when using labour friendly digging tool

Integrated Pest Management (especially concerning the control of insect pests) is the most commonly provided training. In such courses, trainers stress the importance of regular inspection for the outbreak of pests or diseases, so that action is taken before the problem grows. Farmers are taught pest recognition, different control methods, how to prepare organic pesticide, and how to protect themselves from harmful chemicals in commercial pesticides – if such an application is essential. The overall emphasis is on minimal chemical use.

**Pavan Kumari Rajbanshi: Learning new skills after the flood**

Sijuwa-3, Ratuwa river, Morang

*"In the beginning I wondered, can one really farm in the sand? But even if it seemed impossible, we thought that you outsiders [FORWARD Nepal and Helvetas] would*



*support us. Thus, we found courage and started riverbed farming. And then there was a lot of profit. If one has the skills, we found that we could even water the sand [and get plants to grow]."*

In her late 20s, Pawankumari is a member of a marginalised indigenous ethnic group of the Terai. The land belonging to her family, totalling 1 bigha and 6 kathha (0.878 hectares) was washed away during the flooding of the river Ratuwa in 2014. This was a disaster for the family of seven – Pawankumari's parents, two brothers, one sister and one sister-in-law, who found themselves barely able to eat two meals a day.

Following the flood, Helvetas and FORWARD Nepal supported 20 affected families to establish the Divyajyoti riverbed farm association, and to gain official access to the land. The families were given training as well as the necessary resources such as seeds and implements and visited on a regular basis to provide advice and encouragement. Pawankumari's family took up riverbed farming on 8.5 kathhas of land (0.287 hectares), planting vegetables such as watermelon, gourd, bitter melon and pumpkin. According to Pawankumari, *"The first year was okay, we mainly learned the techniques; in the second year, we started getting profit and we learned things that we had not learned in the first year. In the third year, we had even more profit, and we only asked for support in the case of certain difficulties, otherwise we had started to manage minor problems by ourselves. During the third year, we invested about NRs 12,000. But we earned a profit of about NRs one lakh." [Around US \$ 940 at the exchange rate of the time].*

One of Pawankumari's brothers works as a motorbike mechanic, which brings a regular income to the family. Nevertheless, riverbed farming makes a significant contribution to the overall family budget. According to Pawankumari, the profit from riverbed farming has also helped them to buy a cow and a goat, and they have deposited some savings at their local bank and a cooperative. *"Gone are the days when we cried saying that the river floods took our lands; now we can even farm in the riverbeds."*

### Is riverbed farming detrimental to the environment?

Since riverbed farming, by definition, occurs right by the side of water courses, questions have been raised regarding possible river or water table pollution. To date, there is no evidence that this has occurred to any significant degree. Ways in which the risk of pollution are minimised are as follows.

- The use of organic fertilizer (animal dung and compost) is encouraged, rather than inorganic fertilizer. Whatever fertilizer is used, it is applied directly around the plants, rather than widely spread. This reduces the likelihood of any runoff.
- As far as possible, pests are controlled manually (removing the pests themselves, or removing damaged areas of the plant) or through using pheromone traps.
- Farmers are taught how to prepare and apply homemade organic pesticide, made of a concoction of plants including neem (*Azadirachta indica*) and titepati (*Artemesia spp.*).
- If chemical fertilizer or pesticides are used, it is in very small quantities, applied locally.

The alternative use of Terai riverbeds that are not farmed is sand and gravel extraction – an increasing and lucrative practice that is often very environmentally damaging, scouring out riverbeds and destroying riverbanks. Riverbed farming is a far more “environmentally friendly”, sustainable practice.



### 3.4 Marketing

#### Group action and affiliation to cooperatives

The harvesting of riverbed crops begins in late March, peaking in April through early May, when prices are high. To ensure that the farmers benefit from these high prices, however, group action is needed. Helvetas and FORWARD Nepal therefore supported the farmer groups to harvest and sell their products in a collective manner. Where necessary, the project has also facilitated links with specific markets or traders who come to the “farm gate” to buy products.



Kunti Devi Chaudhari of Mohana Riverbed Farming Group, Kanchanpur taking her vegetables to the market.



#### Hanumaani Chaudhary: Better food for the family; respect in the community

Fulbaari, Dhangadhi Submunicipality-18, Kailali

Ten years ago, Indian farmers used to sell watermelon in our village. We, especially the children, really wanted to taste that watermelon. But we had no money to buy them - so we used to exchange the watermelon for wheat. Sometimes, when they brought vegetables, we make a similar exchange. Now, ten years later, we sell vegetables and watermelon in baskets from our own

village. Those who have money pay us directly, and those who don't give us food grains (wheat, lentils) in exchange for vegetables. So much has changed in the last 10 years, I feel really glad just remembering how far we have come from those difficult times! I ask myself, why didn't we start riverbed farming earlier on? If the Indian farmers could do it, why couldn't we?! Why did no-one teach us about this technique before Helvetas came and did so?!"

Hanumaani farms vegetables on about 9 kathha (0.3 hectares) of riverbed along the Mohana river. Starting from 2-3 kathha of land, she gradually increased the area of land as her profits rose, and she still has further plans for expansion. The vegetables she grows include cucumber, pumpkin, gourd, watermelon, and green beans – vegetables that also enrich her own family's diet.

Hanumaani's family numbers nine in total, of whom two sons are working – one on labour migration in Qatar, and one as a grill mason. It was with the profits of riverbed farming that her son could go to Qatar, although they also had to take a loan to reach the total cost of NRs 1.5 lakh or US \$ 1360 approx. Fortunately, that is now paid off, and her son has begun sending money home.

By local standards, Hanumaani's family is not poor. They have 10 kathha (0.388 hectares) of registered land on which grows paddy and wheat. However, this production is inadequate to feed the whole family – hence her enthusiasm for riverbed farming.

Hanumaani is a member of the Sayapatri Women's Group, other members of which have also improved their livelihoods through riverbed farming. She is making regular savings through the group, and in this way has managed to buy 8 kathha of land on mortgage through her riverbed farming earnings. She claims that within her family, her decisions on such matters are supported. Hanumani is also a leader woman farmer – someone who is invited to various functions in her village such as school programmes, Agricultural Service Centre programmes, and other programmes run by various organizations. She is happy with this new-found status, noting that members of the wider community who previously looked down upon her have now started to give respect. People who would not give her loans in the past are now happy to do so. Furthermore, the same people who used to call her and her friends stupid for doing riverbed farming have now started the practice themselves and are coming to her for advice. *"I laugh up my sleeves about how I used to be chided for using farmyard manure on the riverbed rather than applying it to the paddy crop; now I see the same people following my example."*

### 3.5 Market linkages via LRPs

The LRPs are taught basic aspects of marketing as part of their course. This includes simple cost benefit analysis, grading, packaging, and the building of relationships with traders and other stakeholders.

In some cases, individual farmers have taken the initiative to establish themselves as vegetable sellers, as illustrated in the quote below.



*"I have bought a private plot of land at the central market to focus on marketing the vegetables. I did this through the profit I made from selling vegetables that I grew on the Dano riverbed over a period of three years."*

Bhagwan Das Kewat, Kalika Riverbed Vegetable Farming Group, Mayadevi Rural Municipality, Rupandehi

### 3.6 Crop insurance

All farming has risks, and riverbed farming particularly so, given that it takes place in areas that are prone to flooding. Early rains, causing river levels to rise, can result in major losses at harvesting time. Most riverbed farmers report experiencing some losses, although interestingly, flooding is not the main one. According to respondents in the mini-survey by RIDA (2017), the main cause of crop losses is pests (reported by 79% of households), followed by frost (40% of households). Only 32% of households reported flooding as a cause of losses.

Given the risk of losses, Helvetas, and later other Riverbed Farming Alliance partners, linked farmers with the government crop insurance scheme through the Agriculture Development Bank. Under this, the government pays a 75% contribution to the fund, and farmers pay 25%. In the event of a disaster, all the money is paid out. However, the scheme is only based on the investment made, excluding labour costs – not the potential production. Therefore, the amounts paid in compensation are very low.





Kalpana Mandal with son Somit keeping accounts. Photo: Flurina Rothenberger

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## 4. IMPACT ON LIVELIHOODS

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Riverbed farmers harvested an average of 16,500 kg of vegetables per hectare, which are consumed (25%) in the household and sold (75%) at market. Gross agricultural margin per hectare is NPR 135,154 (about US \$ 1,530) (NPR 18,020 (US \$ 204 approx.) for a 1354 m<sup>2</sup> plot). Riverbed farming is labour-intensive during field preparation and harvest times, with 210 person-days necessary to cultivate 1 ha. Farmers earn an average of NPR 644 (US \$ 7.31) per day worked, which is twice the local daily wage labour rate. Source: Schiller, K. 2014

### 4.1 Substantial profits

There is no doubt that riverbed farming has had a positive impact on the lives of many landless and land-poor households. Some have enriched themselves beyond their imagination - buying land, establishing a business and/or building a house with the profits, as illustrated by some of the case study examples in text boxes. Although these stories are perhaps exceptionally positive, they nevertheless show the potential of riverbed farming to change lives.



#### Rasik Lal Murmu: From hunting to farming

Jhare-8, Lohondra River, Morang

Rasik Lal Murmu belongs to the Santhal community, who traditionally lived a hunter gathering existence in the forest. However, it was very difficult to make ends meet. He and 19 other households in his village began riverbed farming just a few years ago, forming the Ganesh Farmers Group at the instigation of FORWARD Nepal and Helvetas. "FORWARD people taught us all the necessary techniques for riverbed farming - how

*to plant the seeds, how to make the seeds wet and how to wrap them properly, the process to use, the distance to leave between the seeds, the amount of fertilizer to put... They have taught all these things. That is how we have made a profit."* Rasikal is particularly intrigued by the pheromone traps used for pest control; as a hunter himself, he enjoys seeing how the insects are trapped so easily.

The Ganesh Farmer's group is made up of 18 Santhal and two Kewat families. Also an indigenous community, the Kewat people used to earn a living from fishing and boating. However, with the local construction of bridges, this source of livelihood has been lost. Riverbed farming offers a new potential source of income, although the public land available on lease is limited. The group is collectively farming five bigha of land – the equivalent of 5 kattha (0.169 hectare) per family.

Having learned riverbed farming techniques, Rasikal took other, private land on lease and started growing vegetables and sweet potato. With the profits made, he then purchased 2 kattha (0.066 hectares) of land. Currently he is leasing a massive 2.5 bigha (1.69 hectares) from a private individual, on which he has expanded his production. According to him, "I've left hunting. Now, I am working hard following the riverbed farming techniques taught to me. It is through this hard work that we are earning a good income."

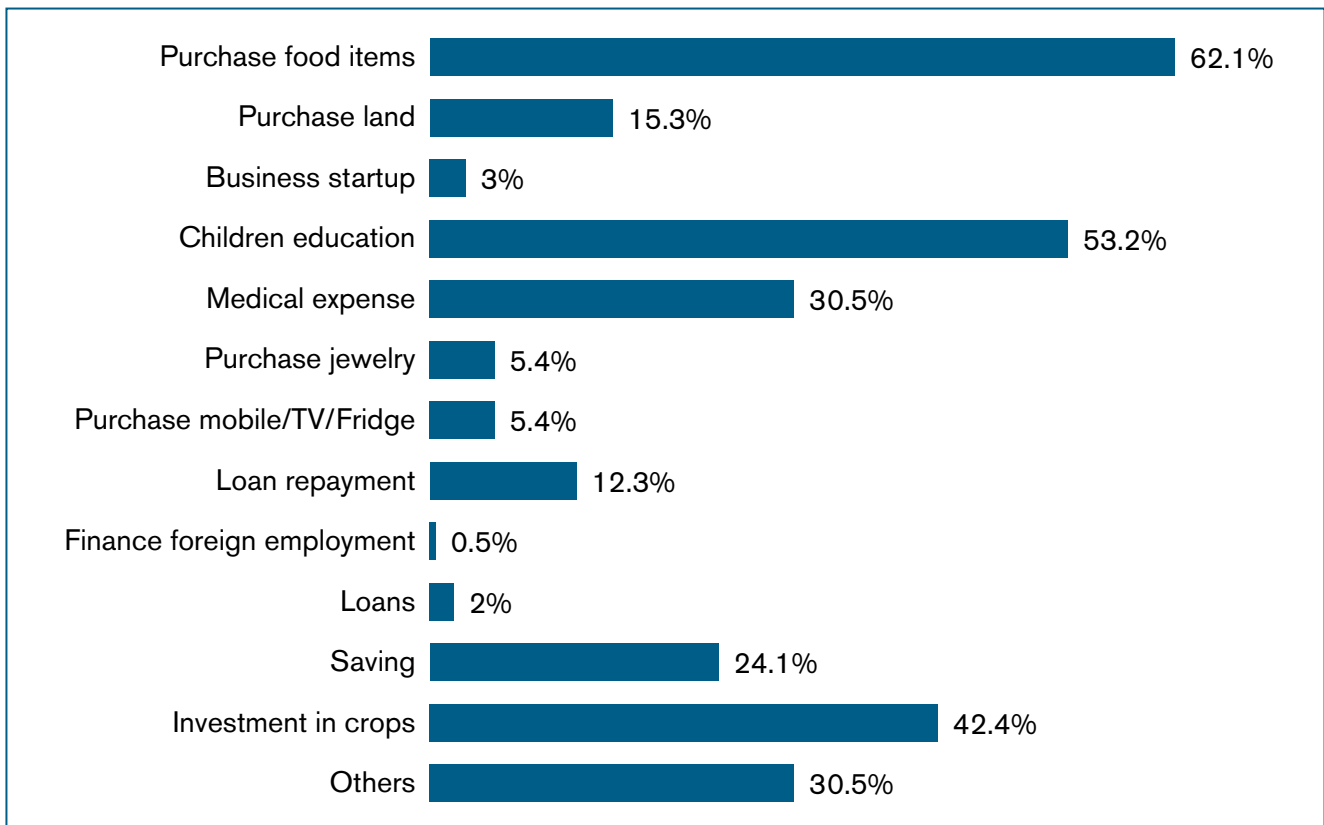


*“Before I started riverbed farming, seeing money was a difficult thing for me. Now, I have a business plan of my own. I have become an entrepreneur. Because of riverbed farming profits, I have bought a motorcycle this year and I plan to buy a power tiller.”*

Prem Chaudhary, Raikarbichwaa, Kanchanpur

Given that it is a seasonal activity, occupying at most half the year, it would be expected that riverbed farming is one of several sources of livelihood. Nevertheless, the mini-survey of riverbed farming households (RIDA, 2017) found that nearly a quarter of those surveyed (23%) considered riverbed farming to be their primary source of income. For the majority (60%), it was considered a secondary source (with the remaining 17% conducting it as more of a side activity). A similar majority (62%) reported using riverbed profits to buy food, amongst other uses – as would be expected if they have no or very little other land.

**Figure 1: How was income from riverbed farming utilized?**



Source: RBFP Evaluation Mini-Survey, 2016



These figures, however, mask the dynamics of poor people's lives and the strategies adopted by households of different sizes. For example, labour migration outside the country is widely seen in Nepal as a key means of economic improvement - one commonly used by families with a young adult son. Yet it is risky, requiring the household to first become indebted to cover the airfare and agency fees. Interest rates are high (in rural areas often 2 – 3% per month, an annual 24 - 36%), and must be regularly paid until the loan is liquidated and the migrant starts earning money to send home. This is assuming that all goes well. In the mini-survey by RIDA, 12% of households specifically mentioned loan repayment as a use of riverbed farming profits, but it is likely that these profits also paid for or substituted migration expenses in many more households. Over half (53%) of all households in the RIDA mini-study claimed to have used riverbed farming profits to educate their children. This shows clear aspirations for a better life for the next generation – probably not one spent in farming. Although primary and secondary state education in Nepal is free, it nevertheless has associated costs in terms of uniforms, materials and transport. Payment for education in this case, however, refers to fees - either for private schools teaching in English medium (or purporting to do so), or tertiary education. The first is seen as leading to the other, and eventual “white collar”, well paid jobs.

With the material benefits of riverbed farming have also come less tangible, but nevertheless very real, life improvements. What stands out from the testimonies of successful riverbed farmers is the respect that they have won from other community members, and the way that this has changed the behaviour of others towards them. This appears to be particularly marked in women, although feelings of pride are also expressed by men.

*“I did not actually do much before I was chosen as the Local Resource Person. Now that I am the local resource person, I have been able to teach the farmers of the village about the riverbed farming technology as well as commercial planning. I feel proud of myself because of this.”*

Vilado Tharu Rana, Local Resource Person, Dekhatbhuli, Kanchanpur

## 4.2 Impact of riverbed farming on women, and household gender dynamics

Women interviewed about their experiences of riverbed farming often stated that it has brought them pride and self-confidence – in earning money themselves and being able to discuss financial matters with their husbands on more equal terms. In some cases (see the text box on Maya Chaudhary), riverbed farming has brought them into community representation and political engagement. In addition, there are many reported cases of husbands returning from labour migration to support their wives in riverbed farming once they have realised the opportunities for profit.

Recently, as part of a women's empowerment initiative, Helvetas has started specific awareness-raising and confidence-building activities with women in riverbed farming groups through a REFLECT approach. Loosely based on the form of adult learning developed by Paulo Freire, these sessions begin by requiring women to fill out time diaries, noting how they spend their days. They then come together to analyse the findings, particularly regarding the amount of time spent in unpaid care activities, and to discuss ways in which they can change their lives for the better. In 2018, nine trainers were trained in this technique, and 60 women farmers participated in REFLECT sessions.

### REFLECT sessions with women riverbed farmers: early results

In their first reflections, the women identified three issues that were particularly important to them. These were the local cessation of the door-to-door child vaccination programme (meaning they had to travel to the Health Post); the lack of a local place to sell their vegetables; and the importance of women's education and therefore avoiding child marriage. Accordingly, they campaigned for the re-institution of the vaccination programme, which was successful. They then investigated the possibility of selling vegetables at the weekly market, which they hope to begin with the next harvest. They also organised a campaign, including a street drama, on the importance of girl children completing their education and not becoming child brides.



Women of Laligurans Reflect Group



### Kalpana Mandal: Riverbed farming as an opportunity for single women Kankai municipality, ward no. 5, Mandal Basti, Jhapa

As single woman, Kalpana points out, *"If you don't have a husband and you are poor, you have no respect in society."* However, through the way that she has improved her situation since she was widowed, Kalpana has won local respect. She was only 21 when her husband died some 10 years ago, leaving

her with one small son. At that time, she moved back into her parent's home, but now she has managed to build a house of her own – one of reinforced concrete and mortar.

Kalpna only learned about riverbed farming through FORWARD Nepal and Helvetas some four years ago. At that time, she was given the basic inputs needed to farm two kathha of land, such as seeds of watermelon and cucumber, and fertilizer. She immediately realised the potential, and rented a further 8 kathha from a private individual (paying NRs 500 per kathha). According to her, *"My son goes to school, and I am alone, thus I must do as much as possible all by myself, whatever I can."*

From the profits earned through riverbed farming, Kalpna has now bought 10 kathha of dry land. In addition, she is also farming a further 10 kathha of riverbed land by lending NRs 35,000 to the landowner without interest. The agreement is that she must only return the land to the owner once he returns the money she has lent him. She is shrewd in her calculations. *"If we farm 10 kathha of dry land, we get a profit of on average NRs 20-25,000, (about US \$ 174 - 217) whereas if we cultivate vegetables in a riverbed of the same size, we get a profit of around NRs 1 lakh (about US \$ 870). Even subtracting the cost of investment, which is usually around NRs. 20-25,000, we still get a profit of NRs 70-80,000."*

Kalpna has enrolled her son at an expensive English medium school in the hope that he will have a good education. She comments, *"Now we no longer have the financial problems that we used to have when I was a labourer. I would recommend other single women like me to work a bit harder and become involved in riverbed farming."*



### Maya Chaudhary: Balancing farming and politics

Kattan Tole, Dekhatbhuli-9, Kanchanpur

Tarai Madhesh Sadbhawana Party's Village Chairperson, Rural Electricity Cooperative's Chairperson, Suryamukhi Agricultural Group's Chairperson, Farmer Project Group's Chairperson, Leader farmer - Maya has various titles. She is extremely active in many local community groups, and a clear role model for others. She is certainly exceptional, but nevertheless her story is interesting in showing what can be possible through riverbed farming.

Maya began riverbed farming over a decade ago, leasing 4 kathha of land (0.13 ha). As soon as she started making a profit, she and her husband invested in farming more land; as a result, they now farm one bigha. Maya also played an active role in farmer group meetings, and quickly established herself as a leader farmer. She believes that this involvement helped her to attain the various positions that she holds today. *"Basically, I am someone who can work hard on the land, and lately I have become known for riverbed farming. Maybe because of this, people have encouraged me to take leadership positions."*

Maya sees political engagement as an important part-time activity but does not intend to let it take over her whole life. *"I have to balance politics and farming, because for the wellbeing of farmers such as us, we have to be involved in politics."* She adds, *"It is because I have been doing riverbed farming*



*well that I am able to be involved in politics, otherwise it would not have been possible."*

Part of Maya's success is undoubtedly due to her supportive husband, Gangaram. He is the LRP for riverbed farming and has taken various trainings on the subject. Maya also attended some of these trainings, so together they make a strong team, also sharing some of the household tasks. The income they make is impressive; in one winter season they now make a profit of NRs 3.5 lakhs (around US \$ 3,300 at the exchange rate of the last harvest, in 2017).

One of the main uses of their earnings is for the education of their two daughters and one son, as well as their daughter-in-law. Their son is studying ISc, the daughters are studying and ISC whereas their daughter in law is studying BBS. They have also bought a motorcycle, which eases journeys to schools, colleges and the market. The profits gained through river bank farming also enabled them to buy one kathha of land in the local market town of Vani bazaar and build a house on it. This they rent out, receiving a monthly NRs 10,000 in rent payment. According to Maya, this serves as their health insurance – for example, one of her daughters had to have a stomach operation which cost NRs 1.5 lakhs (about US \$ 1,363). *"If not for this, how can farmers like us pay for big treatments such as this?."*

There are plenty of local people who tease Maya about her continued engagement in farming activities, now that she has become a politician. There is an implicit assumption that politicians can make money without having to dirty their hands. No doubt there are many who are jealous of her success. Yet Maya has chosen to focus her efforts on speaking in favour of riverbed farming, and those who are engaged in it. For example, she was successful in arguing that riverbed farmers should not be taxed by the local government – the VDC at the time.

*"Initially, I was dependent on my husband to do anything. Once I started getting engaged in riverbed farming, I no longer had to be dependent on anyone. I am now able to do something for myself."*

Pushpa Rana Magar, Laxmi Women's Farmers Group, Khutiya tole, Dhangadi municipality, Kailali



*"When I saw riverbed farming for the first time, I told my husband we should start farming cucumbers ourselves. He said nothing was going to grow on sand, but when I started riverbed farming and earned money, he was really surprised."*

Sukkan Devi Chaudhary, Dekhatbhuli, Kanchanpur

### 4.3 Disparities between plot sizes and lease types

Perhaps the most negative tendency in riverbed farming today is the potential for growing inequality within and between the farmer groups. The original concept of riverbed farming – that of landless or land-poor households taking public land on a free but limited term lease – has now expanded considerably, with many households renting privately owned riverbed land, or even buying such land themselves. The mini-survey conducted for the review (RIDA, 2017) found that the average area farmed by one household is now around 8 kattha (0.27 hectares), although this hides considerable variation – with those households only able to gain access to public land (25% in the mini-survey) leasing a maximum 4 kattha (0.13 hectares) whilst those leasing private land, or a mix of public and private, generally farming at least 10 kattha (0.33 hectares). The remaining 18% percent of the households in the mini-survey were farming their own riverbed land. This divergence is significant, in that there are economies of scale with riverbed farming, meaning that households farming more land make significantly greater profit per unit of land.



Young seedlings are covered under small polytunnels and watered regularly.





Rangeli - Sansari Mai Riverbed Farming Group in Morang district selling their harvest in the field itself.



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## 5. UP-SCALING: RIVERBED FARMING TODAY

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### 5.1 The Riverbed Farming Alliance

The increasing number of agencies supporting riverbed farming gave impetus to collective action at national level, so that the approach could be legally recognised – in a somewhat similar way to the legal recognition of leasehold forestry. Thus in 2011, the Riverbed Farming Alliance was born, one of its first activities being to map out the extent of riverbed farming in the country. This exercise covered 21 Terai districts. The Alliance also collaborated with what was at the time the Ministry of Federal Affairs and Local Development, MoFALD, in drafting a Riverbed Farming Policy and Implementation Guidelines, which was approved. A draft Local Riverbed Farming Promotion Policy was also elaborated but never approved by cabinet. Although it had considerable ministerial support, it was not taken forward because the country then entered preparations for federalisation. It was then clear that it was less a national policy that was needed – given that riverbed farming is applicable only in the Terai and a few inner valleys – than a sub-national, State and municipal level policy framework.

#### The Riverbed Farming Alliance

This alliance was established in 2011 by seven founding members; in addition to Helvetas, they were the UNDP (United Nations Development Programme), PAF (Poverty Alleviation Fund Nepal), the American INGO Mercy Corps, the German INGO GIZ, the Lutheran World Federation, and the Nepali NGO FORWARD. The stated objectives of the alliance are to promote riverbed farming in Nepal; exchange experiences and enhance inter-organisational learning; and support to the Government of Nepal in the development of a national riverbed farming strategy. Collaboration between the agencies was also useful in avoiding any geographical overlap in activities. Over the period 2012 to 2014, the alliance was very active in holding meetings and contributing to policy development. It has not been so active in recent times, and only six members remain. Institutional links continue, as does a website: <http://www.riverbedfarmingalliance.org.np/>

### 5.2 Integration and scaling up by the government

The effective coordination and lobbying with what was then the District Agriculture Development Office (DADO) and Ministry of Agriculture resulted in riverbed farming being prioritised by the national government. A special fund was allocated in 5 Terai districts (Jhapa, Sunsari, Dhanusha, Kapilbastu, Dang) with an allocation of NRs 600,000 (about US \$ 5,230) to each district in 2016. In the now changed context, the Ministry of Agriculture and Livestock Development has continued prioritising riverbed farming as a special programme with scope for the economic improvement of land poor communities. Consequently, the fund allocated through DADO two years ago has not only been continued but was increased to NRs 2 million (about US \$ 17,430) for every relevant Agriculture Knowledge Centre.





*“Riverbed farming is an effective measure to better livelihood of landless and land poor people. A range of activities by different agencies have been undertaken over the past years to promote riverbed farming across the Terai in Nepal. One such example is the partnership between three cooperatives in Dang District and the Nepali German Inclusive Development of the Economy (INCLUDE) Programme initiated in 2009. More than 3800 landless and land poor families organised in 180 producer groups have found a seasonal source of income through the cultivation of more than 500 hectares of dried up riverbeds of Rapti river. More than 2500 families increased their annual household income by more than EUR 200 in 2017. In 2011, Helvetas, GIZ*

*Nepal and several other development organisations joined forces and formed the Riverbed Farming Alliance (RBFA) with the objective to promote riverbed farming in Nepal. The RBFA has become an instrumental platform for sharing experiences, supporting riverbed farming activities and for documenting practices and successes of riverbed farming. An important product of the Alliance is the draft riverbed farming policy. The Alliance should be continued for the promotion of riverbed farming in Nepal.”*

Roshan Shrestha, Deputy Chief Technical Adviser, Inclusive Development of the Economy (INCLUDE) Programme, GIZ



Balbir Chaudhari, Local Resource Person, guiding the riverbed farmers. Photo: Simon Opladen

### 5.3 Current extent of riverbed farming

*"ELAM plus initiated riverbed farming programme particularly engaging the Tharu youth. They were supported to to enhance their income by producing vegetables and marketing them at local markets and in Kathmandu. Rainy season flood has been expanding riverbed areas, and the utilization of unused riverbed for vegetable cultivation has contributed to improved income, nutrition, employment and at some level reduction of youth migration. Even though farmers have been able to obtain good income from riverbed farming, there is a need to use biopesticides and to develop networks with outside market. Looking at the contribution of riverbed farming for improving income and livelihood of landless and low income families, Nepal government has developed guidelines on riverbed farming and has started to allocate budget with cluster approach in 5 Terai districts of Nepal."*

Tikaram Thapa, Senior Agriculture Development Officer, Formerly of DADO (currently working in Rice Superzone in the same position)

*"Riverbed farming is seen to directly benefit the poor communities living close to the river, who have lost their land to it. It is observed that by cultivating vegetables in the fallow riverbeds, considerable reduction in vegetable imports can be attained. Since there also exists a good market for the produce in the Terai as well as the hills, there appears to be no issue related to its market. Acknowledging the potential of riverbed farming, Kanchanpur District Development Committee in the past has supported activities related to riverbed farming. However, continuous support to riverbed farmers can be extended by establishing a separate fund for the purpose. Also, it will be beneficial to align the riverbed farming policy developed in the past to the policy of the local government."*

Tek Bahadur Chand, Programme Officer, Formerly of DDC, Kanchanpur (currently working in the same position in Bedkot Municipality, Province -7)

*"By putting to use the fallow but appropriate riverbed to commercial vegetable cultivation, riverbed farming offers itself as a suitable medium to generate income and to improve the living standard of the marginalized, small and the landless farmers. Continuous effort from the government as well as the non-government sector in the past has led to the progress of riverbed farming and related technologies. Examples abound of it exhibiting good prospects for income generation and employment creation with the ability to displace imports - where farmers have made very good returns by investing very less in capital and time."*

Megh Nath Timalena, Prime Minister Agriculture Modernization Project, Jhapa, Formerly of DADO





Children watch riverbed farmer Basanti prepare vegetables for dinner. Photo: Simon Opladen

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## 6. THE FUTURE OF RIVERBED FARMING

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### 6.1 Federalization

Although a bill was passed in the Nepalese parliament in December 2007 declaring Nepal to be a federal democratic republic, it was only 10 years later, in December 2017, that this became a full reality with the successful conclusion of the last of the elections for municipal, State and federal representatives. There are now 753 elected municipal governments and seven State governments in addition to the federal government of the country.

Elections were preceded by a Local Governance Act (2017) which stipulates the rights and responsibilities of each sphere of government – some of which are exclusive, and some concurrent (that is, shared). In the case of agriculture, responsibility for extension services is fully devolved to the municipalities, replacing the former district set-up of agriculture extension services. In addition, the municipalities are responsible for the management of “public and barren lands including river banks” as well as “the livelihood improvement of landless squatters”. As the quotes illustrate, each municipality plans and allocates its budget for different activities, with many in the Terai specifically recognising riverbed farming in their agricultural planning.

Policy elaboration on agricultural matters is shared between the States and the federal government, depending on the issue concerned. In this new situation, it is anticipated that there will eventually be a policy framework supporting riverbed farming in the States for which this is relevant – that is, States 1, 2, 5 and 7.

*“Farmers involved in riverbed farming have increased due to a lot of help from various organizations. If an embankment is built along the major places at which erosion is likely to happen along the Rapti river, on one hand, erosion will be avoided and on the other hand, riverbed farming land will be available to the farmers. Our rural municipality has also allocated NRs 90 lakhs (US \$ 75,900) for the overall agricultural program in which riverbed farming has been included. As riverbed farming has been a good source of farmers' income, I feel that it should be promoted.”*

Laahuram Tharu, Chairperson, Rapti Sonari Rural Municipality

*“A river is a boon if you know how to use it and a curse if you don't. Currently, various organisations have been helping farmers to be involved in riverbed farming along the river that flows through our rural municipality. Thus, there is no need to cry about the erosion caused by the river. A lot of farmers have improved their livelihood through the river. In our rural municipality meeting have given maximum priority to agriculture, in which riverbed farming is obviously a part. That is why we will actively try to involve as many farmers as possible in riverbed farming to improve their livelihood.”*

Dhup Narayan Chaudhary, Chairperson, Mayadevi Rural Municipality, Rupandehi



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## CONCLUSION

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Over the course of the past 12 years or so, riverbed farming has come a long way - from sporadically farmed plots and opportunistic sales of produce, to an organized system of leasing riverbed land, with advisory services provided by trained local resource persons, and a well-developed system of marketing the off-season vegetables produced. It has served as a “stepping stone” for many landless or land-poor families to buy their own land and take up vegetable cultivation on a larger scale. The fact that riverbed farming has expanded across much of the Terai shows that it has potential for wide replication. At the same time, any new farmers’ groups still need basic support to start activities, given that “growing vegetables from sand” is often perceived as an unlikely way of making money until people have seen it with their own eyes. In addition, river flows are becoming less predictable due to climate change; flash floods can wreak havoc on carefully farmed plots. From this point of view, new areas need to be selected with care, and increasing focus is being given to cultivating river banks rather than areas adjacent to river channels. Yet despite this final note of caution, riverbed farming retains a huge potential to benefit many more landless and land-poor families in the future.

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