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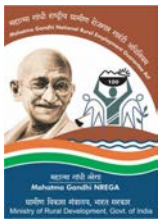
Ministry of Rural Development
Government of India



75 stories

OF CLIMATE RESILIENCE THROUGH MAHATMA GANDHI NREGA

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75 stories

OF CLIMATE RESILIENCE THROUGH MAHATMA GANDHI NREGA

गिरिराज सिंह

Giriraj Singh

ग्रामीण विकास एवं पंचायती राज मंत्री
भारत सरकार
कृषि भवन, नई दिल्ली

Minister of Rural Development and Panchayati Raj
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संदेश

आज दुनिया कई चुनौतियों का सामना कर रही है, जिसमें जलवायु परिवर्तन एक है। जलवायु परिवर्तन के कारण जहाँ कुछ इलाकों में सूखे की स्थिति बन रही है, वहीं अन्य हिस्सों में बाढ़ जैसे हालात बढ़ रहे हैं। भारत भी जलवायु परिवर्तन के इन प्रभावों से अछूता नहीं रहा है। भारत सरकार कई कार्यक्रमों को कार्यान्वित कर रही है, जो जलवायु परिवर्तन के कारण समुदाय पर पड़ते विपरीत प्रभावों को कम करने में सहायक है। महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार गारंटी योजना, दुनिया के वृहद् सामाजिक सुरक्षा कार्यक्रमों में से एक है, जिसकी संरचना इस प्रकार है कि ये ग्रामीण क्षेत्रों में प्राकृतिक संसाधन प्रबंधन की संरचनाओं के निर्माण को बढ़ावा देता है। इन संरचनाओं से जल की उपलब्धता व पेड़ पौधों में वृद्धि तथा भू-पुनर्स्थापन द्वारा अतिरिक्त लाभ प्राप्त हो रहे हैं।

मुझे यह जानकर प्रसन्नता हुई है कि यू. के. सरकार के फ़ॉरेन कामन्वेल्थ एंड डेवलप्मेंट ऑर्गनायज़ेशन एवं भारत सरकार के ग्रामीण विकास मंत्रालय के द्वारा लागू किया गया ताकीनिकी सहायता कार्यक्रम "इन्फ्रास्ट्रक्चर फॉर क्लाइमेट रेजिलिएंट ग्रोथ (आई.सी.आर.जी.)" यह प्रदर्शित करने में सफल हुआ है कि महात्मा गांधी नरेगा अंतर्गत जलवायु सूचक एवं सहभागी कार्ययोजना निर्माण से समुदाय विशेषकर ग्रामीणों को जलवायु परिवर्तन के प्रभावों से निपटने में सक्षम बनाने में मदद कर रहा है। यह कार्यक्रम महात्मा गांधी नरेगा के तहत प्राकृतिक संसाधन प्रबंधन आधारित संरचनाओं की योजनाओं को बनाने में ग्रामीण समुदाय का क्षमतावर्धन करता है, जिससे वे जलवायु परिवर्तन के प्रभावों का सामना करने में सक्षम बनें।

मैं यू. के. सरकार और ग्रामीण विकास मंत्रालय, भारत सरकार के अधिकारियों और संबंधित राज्यों तथा जिले के अधिकारियों को को मैदानी स्तर पर इस कार्यक्रम के प्रभावी क्रियान्वयन के लिए बधाई देता हूँ। आई.सी.आर.जी. कार्यक्रम के तहत *'75 स्टोरीज ऑफ क्लाइमेट रेजिल्यंट थ्रू महात्मा गांधी नरेगा'* का यू.एन.डी.पी. द्वारा तैयार किया गया यह संग्रह, जलवायु परिवर्तन के प्रति वंचित समुदाय के क्षमता विकास द्वारा जलवायु अनुकूलन को दर्शाता है और यह अनुकरण योग्य एक अद्वितीय संसाधन बनेगा।

(गिरिराज सिंह)

Minister of State (Indo-Pacific)
Foreign, Commonwealth &
Development Office
UK Government

The Rt Hon Anne-Marie
Trevelyan MP

FOREWORD

Climate impacts are threatening lives and livelihoods and impeding global efforts to reduce poverty and promote shared prosperity.

Vulnerable countries and communities are being increasingly challenged by the unprecedented frequency and intensity of extreme climate events. The resulting losses and damage are threatening communities' futures. Therefore, our collective ambition response to climate change must include early and anticipatory action to reduce these impacts. I am therefore pleased that Adaptation and Resilience are central to India's climate action plans and development agenda and a focus area of the India-UK partnership.

Since 2016, the UK has been working with India, through the Mahatma Gandhi National Rural Employment Scheme (Mahatma Gandhi NREGS) – the country's largest social protection scheme - to improve the capacity of poor and vulnerable people to cope with climate change impacts. The scale and reach of Mahatma Gandhi NREGS across India provide an opportunity to make millions of people safer from climate induced disasters.

Under this collaboration, I am happy to see the collection of 75 climate resilient stories which demonstrate how effective investment in natural resource management infrastructure built under Mahatma Gandhi NREGS can help support resilient livelihoods and, through a community-centred approach, build the resilience of the most marginalised, including women and children who are most impacted by climate change.

Building on our joint progress and recognising what still needs to happen, these case studies offer a vision of a more secure future for people at the sharp edge of climate change. They provide hope for the future.

(Anne-Marie Trevelyan)

साध्वी निरंजन ज्योति
Sadhvi Niranjan Jyoti

सत्यमेव जयते

उपभोक्ता मामले, खाद्य और सार्वजनिक वितरण एवं ग्रामीण विकास राज्य मंत्री, भारत सरकार
Union Minister of State for Rural Development & Consumer Affairs, Food and Public Distribution, Government of India

संदेश

ग्रामीण समुदाय, विशेष रूप से छोटे, सीमांत किसान और भूमिहीन जलवायु परिवर्तन के बढ़ते प्रभावों से सबसे अधिक प्रभावित हैं। महात्मा गांधी राष्ट्रीय ग्रामीण रोजगार गारंटी योजना (महात्मा गांधी नरेगा) इन समुदायों को जलवायु परिवर्तनों की चुनौतियों से निपटने के लिए 'क्षमता विकास और योजना बनाने' की अतिरिक्त सहायता प्रदान करती है। ग्रामीण विकास मंत्रालय, भारत सरकार और फॉरेन कामन्वेल्थ एंड डिवेलप्मेंट ऑफिस, यू. के. सरकार द्वारा संयुक्त रूप से परिकल्पित तकनीकी सहायता कार्यक्रम 'इन्फ्रस्ट्रक्चर फोर क्लाइमट रेजिल्यंट ग्रोथ (आई.सी.आर.जी.)' योजना के कार्यान्वयन में जलवायु परिवर्तन में अनुकूलन संबंधी विचारों को एकीकृत करके उन्हें महात्मा गांधी नरेगा से जोड़ता है।

आईसीआरजी कार्यक्रम ने ग्रामीण समुदायों सहित महात्मा गांधी नरेगा की योजना बनाने और कार्यान्वित करने में लगे प्रमुख हितधारकों की क्षमताओं के निर्माण के अपने दृष्टिकोण के साथ ग्रामीणों में जलवायु परिवर्तन से निपटने के लिए इस अवधारणा और दृष्टिकोण की सफलता को प्रदर्शित किया है। यू.एन.डी.पी. द्वारा संकलित आई.सी.आर.जी. की प्रभावशाली कहानियों का यह संग्रह इस बात की पुष्टि करता है कि महात्मा गांधी नरेगा सबसे कमजोर समुदायों के जलवायु परिवर्तन से निपटने में एक महत्वपूर्ण कार्यक्रम बना रहेगा।

मैं इस अवसर पर मंत्रालय एवं आई.सी.आर.जी. टीम सहित सर्व संबंधितों को बधाई देती हूँ, जिन्होंने *'75 स्टोरीज़ ओफ़ क्लाइमट रेज़िल्यंट थ्रू महात्मा गांधी नरेगा'* नामक इस संकलन का दस्तावेजीकरण किया है। मुझे यकीन है कि यह संकलन देश भर में इस तरह की पहलों को दोहराने और बढ़ाने के लिए एक महत्वपूर्ण दस्तावेज साबित होगा।

(साध्वी निरंजन ज्योति)

सत्यमेव जयते

केंद्रीय ग्रामीण विकास एवं इस्पात राज्य मंत्री,
भारत सरकार
Union Minister of State for Rural
Development & Steel,
Government of India

फग्गन सिंह कुलस्ते
Faggan Singh Kulaste

संदेश

बदलती जलवायु को देखते हुए, जलवायु परिवर्तन से निपटने में मदद करने वाली आधारभूत अवसंरचनाओं का निर्माण आज के समय की आवश्यकता है। ग्रामीण क्षेत्रों में जलवायु परिवर्तन के प्रभाव सबसे अधिक महसूस किये जाते हैं, इसलिये यहाँ इस चुनौति का सामना करने के लिए प्राकृतिक संसाधन प्रबंधन संरचनाओं का निर्माण किया जा रहा है, जो कि महात्मा गांधी नरेगा के अंतर्गत एक महत्वपूर्ण क्रियाकलाप है।

मुझे यह बताते हुए अत्यंत प्रसन्नता हो रही है कि भारत सरकार और यू. के. सरकार के बीच एक सहयोगी तकनीकी सहायता कार्यक्रम 'इन्फ्रास्ट्रक्चर फॉर क्लाइमेट रेजिलिएंट ग्रोथ (आई.सी.आर.जी.)' के द्वारा महात्मा गांधी नरेगा के कार्यान्वयन के लिए जलवायु आधारित योजनाओं को लागू करने के प्रभावों को सफलतापूर्वक प्रदर्शित किया गया है।

जैसा कि पांच राज्यों (मध्य प्रदेश, बिहार, झारखंड, उड़ीसा और छत्तीसगढ़) की कहानियों के इस संकलन से स्पष्ट है, आईसीआरजी कार्यक्रम में ग्रामीणों को महात्मा गांधी नरेगा के अंतर्गत कृषि तालाबों, नहरों, नदियों, ट्रेंच जैसे प्राकृतिक संसाधन प्रबंधन (एन.आर.एम.) संरचनाओं के चयन और उनके निर्माण, वृक्षारोपण जैसे कार्यों को बढ़ावा देने और लुप्त हो रहे स्थानीय जल निकायों के नवीनीकरण हेतु प्रेरित और प्रोत्साहित किया गया है। इन संरचनाओं के निर्माण से संसाधनों की उपलब्धता में तो सुधार हुआ है, इसके साथ ही उन्हें आजीविका के अवसरों को बढ़ाने में भी मदद मिली है।

मुझे *'75 स्टोरीज़ ओफ़ क्लाइमट रेज़िल्यंट थ्रू महात्मा गांधी नरेगा'* किताब को पढ़कर बहुत खुशी हो रही है। इस अवसर पर मैं इस अद्भुत पहल के लिए मंत्रालय, संबंधित राज्यों में आई.सी.आर.जी. टीम और महात्मा गांधी नरेगा टीम को बधाई देता हूँ।

(फग्गन सिंह कुलस्ते)

Shailesh Kumar Singh,
IAS, Secretary

सत्यमेव जयते

भारत सरकार
ग्रामीण विकास मंत्रालय,
ग्रामीण विकास विभाग,
कृषि भवन, नई दिल्ली
Government of India,
Ministry of Rural Development,
Department of Rural Development,
Krishi Bhawan, New Delhi

ACKNOWLEDGEMENT

Water conservation and water harvesting works under the Mahatma Gandhi NREGS are playing a vital role in the rural landscape by supporting sustainable management of land and water resources. Through employment generation, the Mahatma Gandhi NREGS is creating assets for water conservation in convergence with many other government initiatives like Integrated Watershed Management Programme, Pradhan Mantri Krishi Sinchayee Yojana, Forestry, Horticulture etc. Likewise, Infrastructure for Climate Resilient Growth (ICRG) is a technical assistance (TA) programme of the Government of UK in partnership with the Government of India, implemented across six Indian States. ICRG aims to improve abilities of poor and vulnerable people to cope with climate change impacts by integrating climate information services and risk management into India's social protection framework. This document is an attempt to capture such success stories and case studies, which has brought climate resilient impact in the lives of rural people and farmers particularly.

Our Ministers Shri Giriraj Singh, Minister of Rural Development and Panchayati Raj, Sadhvi Niranjan Jyoti, Minister of State for Rural Development & Consumer Affairs, Food and Public Distribution and Shri Faggan Singh Kulaste, Minister of State for Rural Development & Steel, are beacons of support in this endeavour.

Without the support of State Governments the program would not be successful in mainstreaming climate resilience into planning and implementation of the Mahatma Gandhi NREGS.

The efforts of UNDP, as the main implementation partner, did not go unnoticed as the interventions adopted under the ICRG programme in the States demonstrates a unique approach of integrating climate risk management into rural planning and development that enhance the overall livelihood and income generation capacities of rural communities. Their sincere contribution in converting these case studies into a publication will also help others to learn many aspects of the program.

(Shailesh Kumar Singh)

सत्यमेव जयते

भारत सरकार
ग्रामीण विकास मंत्रालय,
ग्रामीण विकास विभाग,
कृषि भवन, नई दिल्ली
Government of India,
Ministry of Rural Development,
Department of Rural Development,
Krishi Bhawan, New Delhi

Amit Kataria,
IAS, Joint Secretary (RE)

PREFACE

India is amongst the countries that are highly vulnerable to the impacts of climate change, with large parts of country's rural population dependent on climate-sensitive sectors such as agriculture and forests, any adverse impact on water availability due to changes in precipitation levels and falling groundwater tables are likely to adversely affect livelihoods and food security of people. Extent of vulnerabilities varies across different States of the country which directly or indirectly depend on the socio-economic profile of the people, topography of the states and their exposure to climate change. To address the dual challenges related to development and climate change, the National and State Governments in India have formulated various strategies which are being implemented through various programmes and policies. The Mahatma Gandhi National Rural Employment Guarantee Programme (Mahatma Gandhi NREGA) is one of such important programmes in India that aims at meeting both – climate and sustainable development goals of the country. Over past several years, Mahatma Gandhi NREGA has succeeded in providing basic income to rural poor and reducing the poverty levels, while also focussing on building natural resource management structures and other infrastructure in rural areas that helps support rural economy.

Infrastructure for Climate Resilient Growth (ICRG) - a technical assistance programme of the Foreign, Commonwealth and Development Office (FCDO), Government of UK is implemented in partnership with the Ministry of Rural Development (MoRD), Government of India with United Nations Development Programme (UNDP) as ICRG's main implementation partner, has demonstrated how the development gains from Mahatma Gandhi NREGA are sustainable and climate resilient by integrating climate risk management into its planning and delivery. This publication is an excellent compilation of 75 stories from ICRG programme showcasing how climate informed planning of Mahatma Gandhi NREGA infrastructure could support resilient livelihoods through ground water recharge, micro-irrigation, soil and water conservation, plantations, etc. These stories and case studies will serve as the model of planning and implementing rural development programmes that can be replicated and scaled across other districts and States.

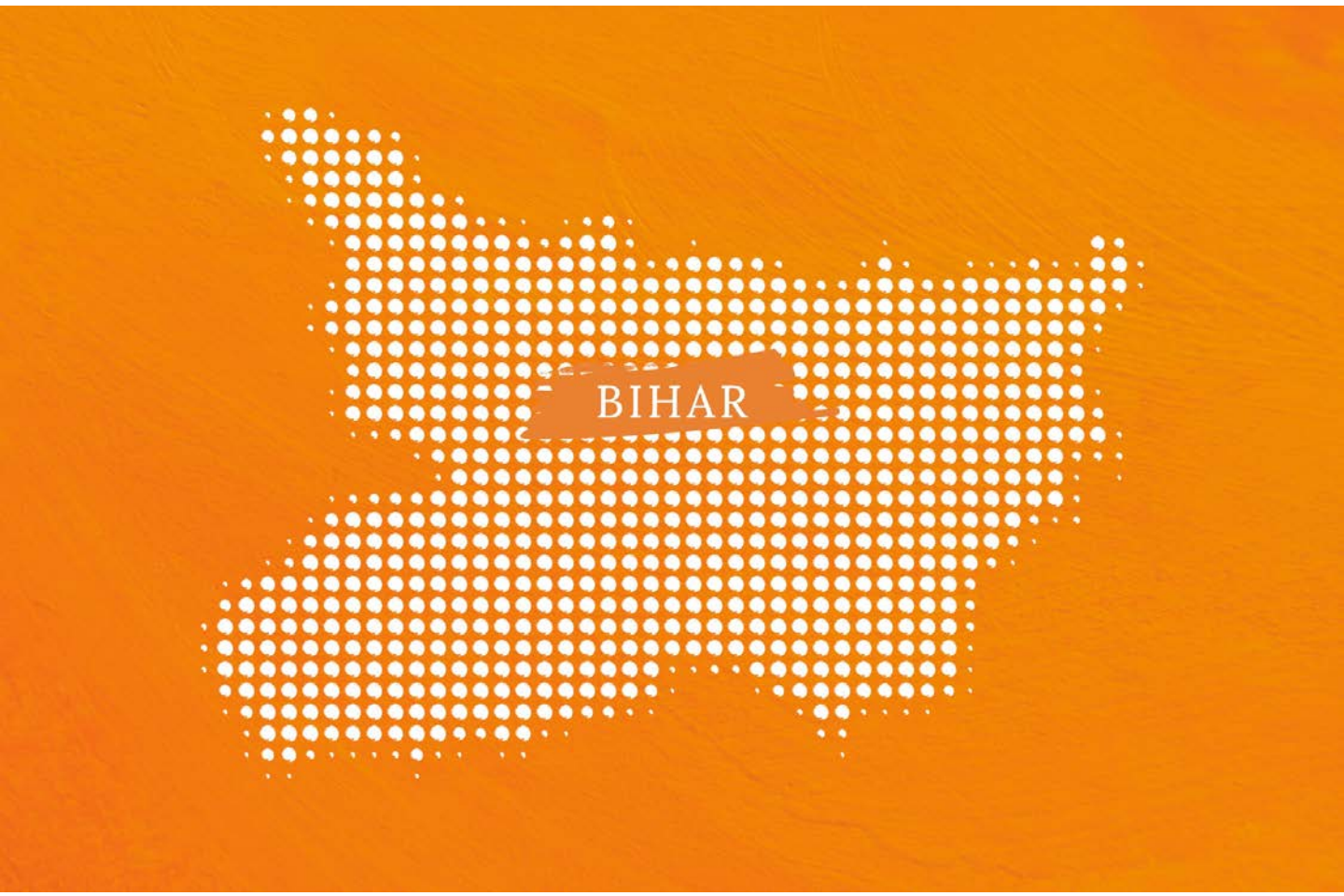
(Amit Kataria)

INTRODUCTION

As part of ***Azadi Ka Amrit Mahotsav*** initiative to celebrate 75 years of independence and the rich heritage of its people, culture, and accomplishments, the ICRG Programme has dedicated this compendium of 75 inspiring success stories that showcase climate resilience achieved through Mahatma Gandhi NREGA. This collection highlights the positive impacts of ICRG interventions, which ingeniously integrate climate risk management into planning and implementation of social protection programme, empowering rural communities with enhanced livelihoods and income generation. These inspiring stories hail primarily from the States of Bihar, Odisha, Chhattisgarh, Madhya Pradesh and Jharkhand, showcasing reduced vulnerability to climate risks through increased groundwater availability, improved soil fertility, expanded tree cover, and the implementation of drought and flood-proofing measures, all achieved by integrating climate information services and risk management into planning and implementation of Mahatma Gandhi NREGS works.

The Natural Resource Management (NRM) component within Mahatma Gandhi NREGS is a monumental endeavour that greatly enhances the productive capacity of land, water, and forest resources. Through ICRG interventions at both national and sub-national levels, investment in NRM infrastructure is optimised to bolster resilient livelihoods, particularly in agriculture. This compendium is a testament to the collaborative efforts of dedicated stakeholders who have played a vital role in the successful implementation of the program across various states.

The development of this publication received extensive guidance from Shri Dharmvir Jha, Director, Ministry of Rural Development, Government of India, and his team from the Ministry and support from Ms Daljeet Kaur, Climate and Environment Advisor, FCDO, Government of UK. UNDP, as the main implementing partner of ICRG programme, played the key role in compiling the success stories and shaping the compendium, through its team –both at National level and in the respective project States. Similarly, the other two implementing partners of ICRG – IIED and PHIA provided support in collating success stories from Madhya Pradesh and Jharkhand. The State level support on collection and validation of these success stories was provided by the respective State level agencies, namely, the Rural Development Departments (Bihar and Odisha), the Panchayati Raj & Drinking Water Department (Odisha), the Department of Panchayat & Rural Development (Chhattisgarh), the Department of Rural Development (Jharkhand), the Department of Panchayat & Rural Development (Madhya Pradesh).


BIHAR

1

Mahua village is located in West Champaran district near Nepal border. Even though the village lands can sustain two crop cycles in a year, farming was still difficult because of flash floods that led to high losses across plantations and hampered effective drainage of water. Average annual rainfall in the region is about 1430 mm.

As the villagers of Mahua were looking for a long term solution for their problem, ICRG team recommended construction of pyne structure that was subsequently executed under Mahatma Gandhi NREGA. The total cost incurred during the project was INR 3.95 lakhs.

Diversifying the crop base in the village was also suggested as an option for augmenting the income. Farmers were linked to the Agriculture and Horticulture departments and ICRG team facilitated their registration with the Agriculture and Horticulture Departments for assistance. This enabled access to a variety of seeds at subsidised prices. Several farmers in the village have benefitted by receiving up to 50% of the total cost of cultivation as subsidies to cultivate newer varieties of vegetables like cauliflowers on their land.

131 farmers belonging to this village were directly benefitted as the excess water from 26 acres of land flowed out without damaging the crops. These farmers are now able to fetch additional INR 12-17,000 from sale of vegetables to nearby markets, apart from self-consumption.

2

As a community of small-scale landowners comprising of nearly 50 families, Mahua village of West Champaran district has a strong sense of community , which is why the residents work together on each others fields. This allows better results in less time, whether it is cultivating the final produce or planting seeds in the fields.

Through Mahatma Gandhi NREGA, works like rejuvenation of ponds, plantation, micro-irrigation channels, cattle sheds and work on individual lands worth INR 51.43 lakh has been done in the GP. ICRG team along with Mahatma Gandhi NREGA functionaries, worked in designing pyne structure in Mahua village in Maintand block of West Champaran. **Works such as widening and deepening of irrigation channel were planned and designed, due to which 45-acre additional area is now being irrigated, benefitting 159 farmers.** The total cost incurred during the project was INR 4 lakhs.

The low temperatures in this area are yet another challenge for the farmers – it is too cold for seeds to germinate into saplings. ICRG team also sensitised the community regarding crops and agricultural practices to be adopted for the region conducive to low temperature climatic conditions.

"I have earned additional INR 23,000 this year from cultivating cauliflower and table-pea using a shade-net (plastic sheets on a bamboo frame) that was suggested by the ICRG"
Bir Kishore Mahato, Farmer, Mahua Village

Dharmdiha village in Madhubani district, with a large number of landless households has become a model village for sustainable growth under the Jal Jeevan Hariyali Mission. ICRG team along with Mahatma Gandhi NREGA functionaries discussed the challenges with the community in detail, and helped them in mapping climate resilient natural resource management (NRM) structures that can be constructed in the village, and facilitated their detailed planning. Phase-wise implementation of structures was planned to benefit all categories of households residing in the village for overall growth and building resilience.

The NRM structures have hugely augmented the availability of water for irrigation, thus enabling improved livelihoods and increased income of approximately 230 households by 20-30%. Even 64 landless households have benefited through generation of alternate livelihood opportunities like growing mango plantation on leased land. Double cropping has also started in close to 90 percent land with availability of sufficient irrigation water. Further, approximately 50 percent reduction in surface water flow could be achieved through soil and water conservation activities. The total cost incurred for the structures was INR 4.17 crores, which **directly benefitted 312 farmers covering an area of 364 acres of land.**

"Due to the increased availability of water this year, we were able to earn Rs. 75,000 from sale of mangoes that we grow on 2.5 acre of leased land."
Md. Irfan and Md. Shahbir Ansari, Beneficiary, Dharmdiha village

"Even though I do not own any land, the increase in plantations has benefitted me as I earn INR 1800 per month from the Panchayat and other farmers, for maintaining trees on public areas and plantations."
Boku Sadai, Beneficiary, Dharmdiha village

4

Phulkari's block of Mahbubani district receives very heavy rainfall, which results in overflow of small water bodies thus posing danger to the structures in the area including in village Dharmdiha. The villagers wanted a solution to this problem to protect their crops. The ICRG team along with the Mahatma Gandhi NREGA functionaries, PRI members and villagers of Dharmdiha first mapped the village resources and planned for interventions to build climate resilience. The ICRG team facilitated designing of a pond and connecting it's overflow towards the patch of land that was barren and was unused.

As a result, the community pond constructed under Mahatma Gandhi NREGA in Dharmdiha now provides water throughout the year and benefits 200 families of the village. The pond is a source of water for irrigation purposes. Through groundwater recharge, the wasteland patches of the region have been transformed to cultivable land. Further, comprehensive water management and planning exercise has been undertaken under Mahatma Gandhi NREGA and 50 individual soak pits have been constructed in the village. This has led to improvement in sanitation and hygiene conditions at household and community level. The total cost of the project was INR 5.11 lakhs. **35 farmers directly benefitted with area coverage of 27 acres of land.**

"My small land holding of 0.37 hectares of land is transformed from wasteland to cultivable land and I am now able to grow crops like paddy and maize bringing me additional income of INR 21,000 this year"
Umeshwar Prasad Singh, Farmer, Dharmdiha village

Mageli village is located in the Falka block of Katihar district. The village has a close knit community of 25 families, with no land holdings and meagre sources of income. During Gram Sabha meetings, the ICRG project team suggested construction of a community pond to address the problem of shortage of potable water in the village. Technical changes were suggested in the designing of the pond to enhance benefits, including construction of 3 staircases (1m each) for easy access for women and elders.

The cost of construction of community pond was INR 3.38 lakhs. **The community pond now meets the water requirements for domestic use and irrigation purpose. 37 acre of land of 32 farmers is benefitted.** Fish farming has been taken up as new livelihood opportunity. Additionally water is being conserved to recharge ground water.

Md. Nazir and Md. Budhan are two beneficiaries. Md. Nazir and Md. Budhan now earn INR 26,000 per year from cultivation of foxnuts and INR 16,000 per year from maize cultivation respectively due to the rejuvenated pond . The availability of water in the pond has encouraged farmers to undertake banana cultivation also.

"Despite not owning any land, we are now able to farm due to availability of water. Foxnut farming is difficult, but this is one of the few regions that grow the crop and even though the use of instruments like the gajiya makes it easy, it is still technical and intensive."
Md. Nazir and Md. Budhan, Farmers, Mageli village

In Magheli village of Katihar District, pond rejuvenation work was caried out under the Mahatma Gandhi NREGA. Technical support in selection of scheme and integration of climate resilient aspects like slope, staircase, inlet-outlet construction and plantation was recommended by ICRG team during the community meeting of the village. ICRG team also undertook capacity building sessions for Mahatma Gandhi NREGA functionaries, PRI members and community on climate resilient practices, livelihoods and convergence activities which could be taken up in Magheli. The pond now fulfils the community's water requirements and is also used for fish farming.

The rejuvenation work costed around INR 3.38 lakhs, through which 2.7 acre of land is being irrigated. ICRG also supported convergence with other departments' developmental programme in the village. Md. Zamiruddin is a direct beneficiary of the Krishi Vigyan Kendra project initiated by the state government. He received kidney beans seeds from the State Agricultural University, Patna along capacity building support. Kidney beans (Rajma) cultivation uses less water and has a short cycle and isideal for farmers like Zamiruddin who now earn higher income from the high-value kidney beans. He cultivated kidney beans in his 1-acre land earning INR 32,000 in a year from selling the produce.

Md. Yuken is one of the few landowners in Mageli village, who was farming prior to the rejuvenation of the pond.

"My experience has been very positive. From struggling to irrigate our lands, to now having continuous access to water, I have personally seen an improvement in crop harvest and increased profits with each passing year, thanks to the construction of the pond."
Md. Yuken, Farmer, Mageli Village

7

Mahoba village in Dandari block of Begusarai district has several small farmers whose livelihood depends on agriculture. The irrigation for some of these farmers -covering an area of 2ha -was supported by water from a nearby stream that passes through their fields. Almost every year, the monsoon causes flash floods in this stream, leading to siltation, with an overflow of water into agricultural lands. The area is majorly mono cropped due to lack of irrigational facilities. Most of the farmers in the village are adversely affected due to climate change induced periodic droughts and floods.

In response to the villagers demands raised during community meetings, the ICRG team worked with Mahatma Gandhi NREGA and the State Water Resources Department in preparing the treatment plan of the pyne. The de-siltation of 1 km stretch of the stream was done under the Mahatma Gandhi NREGA. The cost of de-siltation of the stream was around INR 7.28 lakhs. The slope was designed in such a way that excess water during peak rainfall drains out further downstream without affecting the agricultural lands.

The stream now supports irrigation of more than 10 ha and is benefitting 50 farmers from Mahoba village with access to irrigation water. 400 agri-horticultural plants planted alongside the pyne would additionally help in livelihood and income generation of the villagers.

Anuj Kumar is one of the direct beneficiaries of restoration of pynes. He observed that his fields have an the average yield of wheat from his fields increased by 20% per annum .

“The availability of water and increased safety from flash floods has given us the confidence to try out new things, like moving towards high value crops or short duration crops to grow between the rabi and kharif cycles.”
Anuj Kumar, Farmer, Mahoba village

Jal-Jeevan-Hariyali Mission encourages water conservation and sustainable farming practices across Bihar state. The mission supports awareness building and infrastructures wherever required. The treatment of stream of Mahoba village in Begusarai district under Mahatma Gandhi NREGA, has proven to be a valuable source of additional livelihood for the villagers.

ICRG team had undertaken capacity building sessions for Mahatma Gandhi NREGA functionaries, PRI members and community on climate resilient practices, livelihoods and convergence activities which could be taken up in Mahoba village. Individuals like Anil Sadda and Phulo Sahni practice fish farming facilitated under Jal-Jeevan-Hariyali. This way, the returns increases from climate resilient works designed under the ICRG programme with Mahatma Gandhi NREGA.

Through the Jal-Jeevan-Hariyali Mission, Raj Kumar received a hand pump for his land. He has planted 400 timber plants such as Arjun and Mahogini on his land. He has installed fencing surrounding his land and gets monthly stipend from the state government to maintain his plantation. At the end of the pyne, 2 Sahani families are able to do fish farming for one season helping an additional income of INR 18,000 per year.

"With increased availability of water, my vegetable plots of chilli, brinjal, garlic and onion, etc. on 1.5 ha of land have been successful for first time in recent years and I have been able to earn INR 41,000."
Chamru, Farmer, Mahoba village

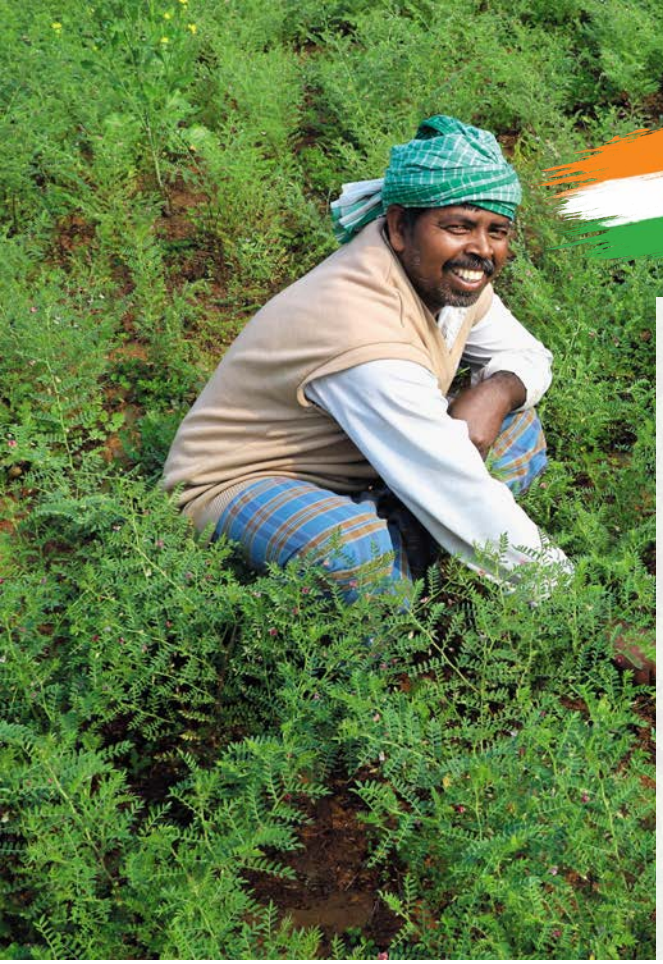
9

Saidpur village in Nagarnausa block of Nalanda district of Bihar is mainly dependent upon a small stream that joins river Phalgu, for irrigation since agriculture is the mainstay of economy in this area. While the stream is able to provide irrigation for only few farmers, it is also proves to be problematic as heavy rainfall often leads to flash floods during monsoons.

ICRG team along with Mahatma Gandhi NREGA functionaries and PRI members visited the village for a discussion with the local community to plan for the works that can be taken up under Mahatma Gandhi NREGA for augmentation of irrigation and safety from flash floods. Based on the suggestions from ICRG team, the Gram Panchayat decided to re-design and work on the slopes of pynes considering the historic and projected rainfall data from climate modelling. A check-dam was also proposed and constructed at the junction of three pynes. The height and other factors were calculated considering peak discharge of water.

44 households from this village owning approximately 43.35 acre of land have directly benefitted from the structure. The total cost incurred during the project was INR 14.27 lakhs. The intervention has also enabled availability of the additional water to 7 villages adjoining villages covering more than 300 acre, thus enabling them to grow a second field crop.

"Due to increased moisture content in the field, irrigation requirement in field crop has reduced and has allowed us to take up crops like vegetables, wheat, pulses, etc. in Rabi season as well. This has increased our income by INR 12,000 per year"
Farmers, Saidpur village



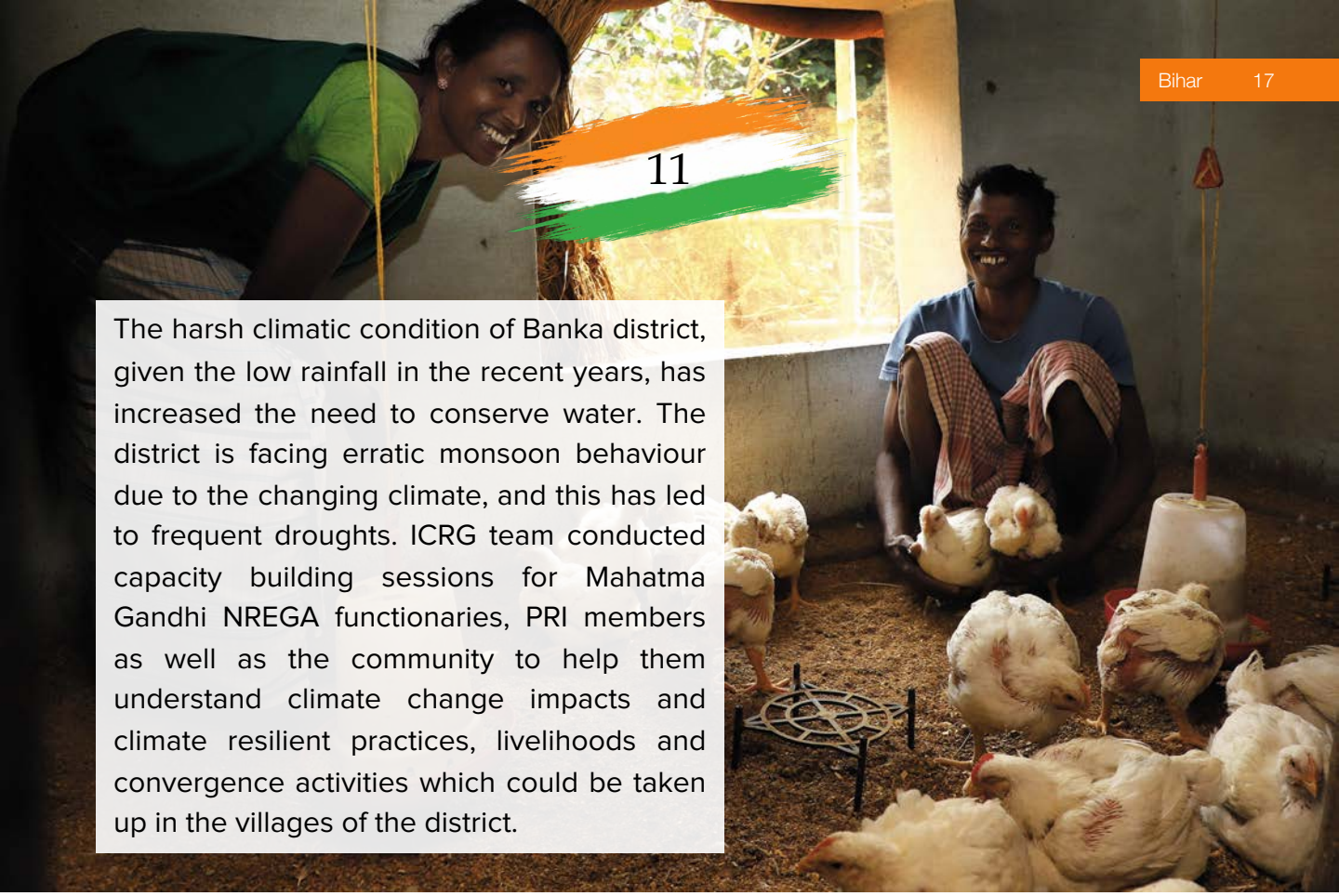
10

Farmers in Ramsagar village in Bausi block of Banka district were unable to cultivate more than one crop because of inconsistencies in rainfall. Villagers raised this concern during the Gram Sabha meetings and the Gram Panchayat took several water conservation works under Mahatma Gandhi NREGA, like the check dam with irrigation channels. The check dam and irrigation channels were designed as per the ICRG team's technical guidelines and recommendations The catchment area of the structure is around 40 ha. Cause-way construction across the dam was proposed, for easy transportation. This feature has helped women, elderly and disabled personnel in peak rainfall season.

The Ramsagar check dam caters to 20 ha land and benefits around 25 tribal households with availability of water for irrigation during Kharif crops. Farmers of the region now cultivate three seasonal crops in a year. The dam also provides water for domestic uses, benefitting a total of 150 families, including 70 farmers. The cost of construction of check dam was INR 8.73 lakhs.

"Following the construction of the check dam, we are now able to cultivate onions, chickpeas and chillies, which are high value, short duration crops between the rabi and kharif seasons, in our small patches of land enabling us to earn extra income which was not possible earlier."

Sukhi Laal and Babu Ram, Farmers Ramsagar village



11

The harsh climatic condition of Banka district, given the low rainfall in the recent years, has increased the need to conserve water. The district is facing erratic monsoon behaviour due to the changing climate, and this has led to frequent droughts. ICRG team conducted capacity building sessions for Mahatma Gandhi NREGA functionaries, PRI members as well as the community to help them understand climate change impacts and climate resilient practices, livelihoods and convergence activities which could be taken up in the villages of the district.

An irrigation channel was constructed under Mahatma Gandhi NREGA in Ramsagar GP in Bausi block, with technical support from ICRG. The irrigation channel flows from Ramsagar to Kanikhet village in the Bausi block. **The overflow of water from the 5-ft Ramsagar check-dam is directed towards farmlands through this irrigation channel, which helps 30 farmers cultivate moong dal and vegetables.** The ICRG programme in Kanikhet village of Banka district also facilitated convergence with various government programmes on animal husbandry and moong cultivation, among others.

"The training and support received from ICRG enabled me to take up this activity of poultry farming and now I am able to earn an additional INR 6,000 annually"
Military Murmu, Beneficiary, Kanikhet village

12

Katihar district is a part of the lower Ganga basin, lying between the Kosi and Mahananda sub-basin. The regional slope takes a tilt from west to east and is often flooded with river waters from Ganga, Mahananda, Kosi. As a result, the region's soil is slightly sandy. The Ahuta village in Sinhagaon GP of Katihar district is located near West Bengal border, where 80% population are of SC/ST and minorities like OBC (Other Backward Castes).

Three ponds in the village had to be rejuvenated to overcome irrigation and domestic water scarcity. The GP has 1,936 landless farmers, who are dependent on Mahatma Gandhi NREGA for wage employment. The ICRG team supported Mahatma Gandhi NREGA functionaries with technical inputs to plan the inlet-outlet of the ponds along with the plantation.

These ponds have aided water conservation efforts in the village, supplying water for irrigation and domestic purposes. The outlet channel is used as a drainage to provide access to water for irrigation purposes. These ponds also help provide water to the villagers for their daily use. The revival of these ponds costed around INR 5.29 lakhs. **These ponds are helping conserve 1,15,564 cubic metres of water and the irrigated area has increased from 15 ha to 29 ha.**

13

Chanan block in Banka district is situated on the border of Jharkhand, with a geographical terrain of forests and hills. Nikothi village of Birniya GP located in this block comprises mainly of SC & ST communities. Their livelihood depends on agriculture as many of them are primarily agricultural wage labourers. The region receives an average rainfall of 700-900 mm. Villagers require supplementary irrigation during the later stages of kharif season.

The discussions with community and PRI members resulted in the identification pond rehabilitation as one of the works under Mahatma Gandhi NREGA. ICRG team provided technical guidance for the design of the pond. The pond was desilted, and it was designed to ensure maximum capacity storage during a critical period. Further, multiple livelihood options were provided by linking the farmers with schemes of the Agriculture Department, including additional activities such as vermicomposting, farmer registration and better-quality seeds, etc.

The total cost of revival of pond was INR 3.14 lakhs. **The rejuvenated pond serves 35 families of SC/ST community and irrigates 9-10 ha of land. Beneficiaries have now started growing cash crops which has increased their income by as much as INR 12,000 per annum.** Since the intervention, 24 families have started vegetable production. The ICRG team also linked the farmers with the Agriculture Department for technical training and improved seeds/saplings etc. and marketing support to nearly 50 farmers in Chanan block.

14

Rampur Maheshpur village is a large village with 525 households located in Tajpur Block of Samastipur district. During community consultation, the villagers raised several issues related to water scarcity and requirement for irrigation. Mahatma Gandhi NREGA functionaries, who worked in consonance with the ICRG programme, suggested the intervention of rejuvenating the pond in the village.

In line with the technical recommendations by the ICRG team, the pond repair work, including inlet and outlet, was undertaken. Another significant intervention was plantation in 2-3 acres of land around the village's community park. The villagers were consulted for the intervention through Gram Sabha during FY 2020-21. Pond-related work was taken up under Mahatma Gandhi NREGA, while the plantation efforts were facilitated by the forest department. The construction of pond costed around INR 2.8 lakhs. This intervention generated 45,000 man-days of work.

The outlet is connected to a structure through which water flows to the agriculture field for irrigation. Staircases and ghat (platform) were also constructed for better accessibility of the pond. Major species like Sagwan, Mango, Jamun, Amla and Pipal were planted on the bunds of the pond. **Before the intervention, the total area under wheat cultivation was 600 acres, which has now increased to 800 acres. Wheat production, which was 16 quintal per acre before, has now increased to 20 quintal per acre.**

15

The Ekamba Gram Panchayat of Chhorahi Block is located in the Begusarai district. According to Climate Variability Report, temperatures in Chhorahi block of Begusarai will rise by 3.9°C by 2035. It is also projected that in the period between June and September, the average rainfall will decrease by 8%. Approximately 12-13% of Ekamba's total population belongs to the Musahar community, who are one of the most backward/underprivileged communities living on the periphery of the GP.

In response to the demand from villagers, the ICRG Team suggested an action plan to mitigate the challenges faced by the community. Training on climate change, Climate Resilient Works (CRW), livelihoods and participatory mapping of the village were undertaken. Along with the community, the team decided to develop an integrated NRM model in each ward under the Mahatma Gandhi NREGA, which would ensure long term income generation activities as well.

Mahatma Gandhi NREGA has played a significant role in combating the area's perennial flood problem by taking up NRM works as priority schemes. The works in the GP included development of a small farm pond, along with poultry, fishery and cattle shed. Further, the cow urine and dung can be used for vermicomposting and organic manure. The project coverage targeted the most vulnerable households of the GP with a cost of INR 7.08 lakhs.

The project intervention has directly benefitted 25 families with 13 ha of land through irrigational facilities and fishery-based livelihoods. The capacity building also encouraged 52 additional farmers in Ekamba, who have constructed farm ponds in their backyard, from their own resources for twin purposes of fishery and duck rearing.

"On similar lines in the neighbouring gram panchayat of Parora, many farmers have started taking up dual models of paddy cultivation with fishery."
Farmer, Ekamba Gram Panchayat

16

East Champaran district is situated in North Bihar bordering Nepal. The district has rugged topography. The region experiences heavy rainfall during the monsoon months of June, July and August with an average annual rainfall of 1200mm. Despite this, the women of Belwaray Gram Panchayat travel long distances to fetch water because of a lack of water conservation structures. The demand for such structures was raised during a Gram Sabha, when the ICRG team was conducting capacity building sessions on climate resilience and opportunities through convergence.

The lack of water conservation structures in Belwaray GP, has resulted in excess groundwater depletion over the years. To address this, in conjunction with the community, work was initiated on the Amrit Sarovar pond under Mahatma Gandhi NREGA. Another convergence with PRI funds for additional work was also initiated, with the aim to make the site a model structure for the area. The ICRG team provided technical support for designing of the pond, including parameters like slope, inlet-outlet, etc. Encouraged by the impact of the interventions, community members have also started contributing towards construction of pond and other related work.

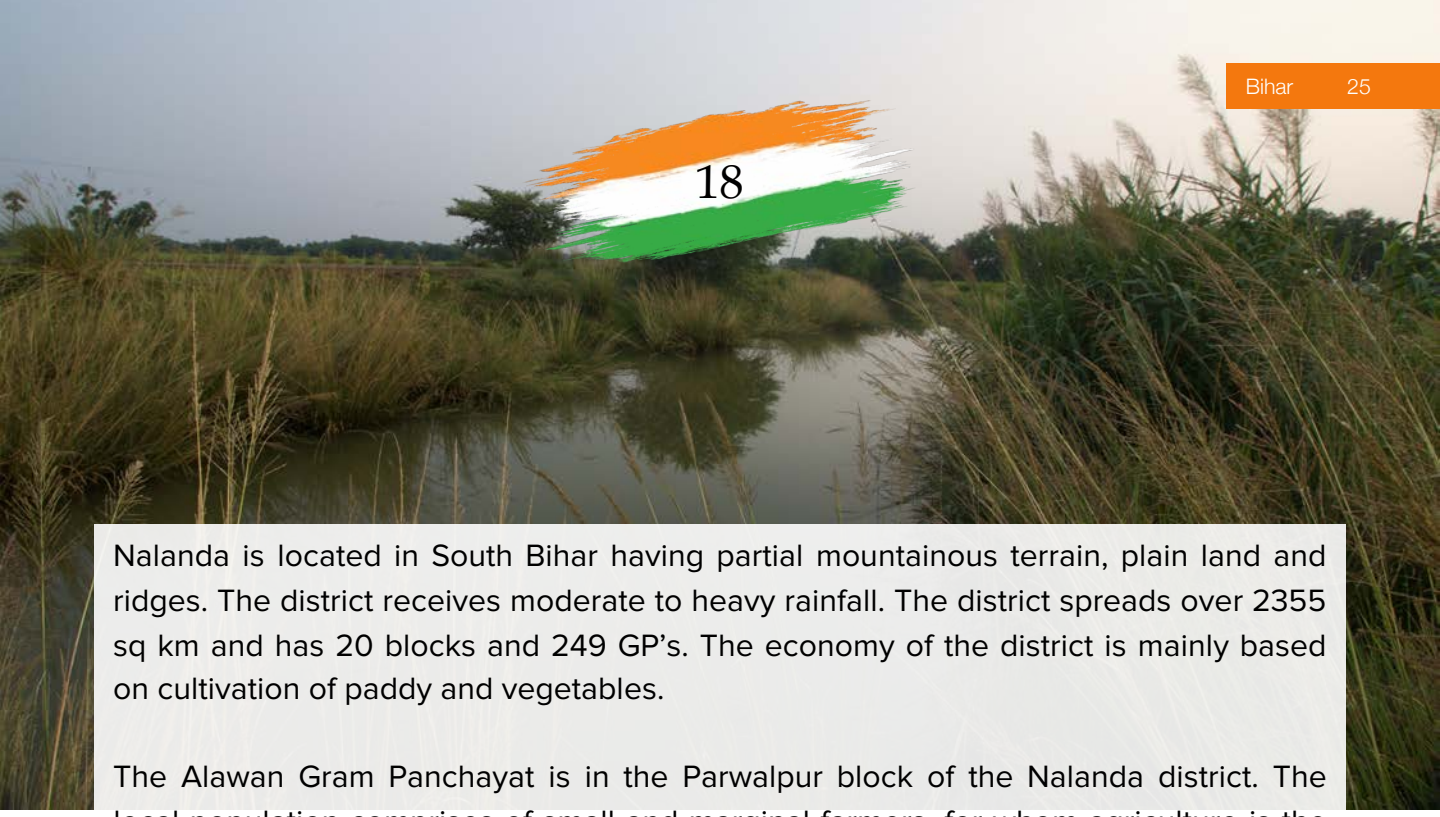
The total cost of pond was around INR 12.01 lakhs. **The pond will benefit 24 farmers and irrigate as much as 13.5 acres of land.** The effort of Gram Pradhan Smt. Pratima Kumari is well appreciated for the initiative, which has become a role model of climate resilient work for the district.

17

Dhanauti river starts at Gahiri in Nautan (West Champaran district) and travels about 75-80 kms to reach Bardaha in East Champaran and terminates into Budhi Gandak River. The river is inundated by floods every year, as the flow of the river is disrupted due to heavy siltation on the bed of river. Banjariya block is severely affected block by flood. To address, the ICRG team extended technical support to design and implement 20 works under Mahatma Gandhi NREGA, which included the strengthening of bunds of irrigation channel and de-siltation of reservoir in tandem. The team worked with community and the Mahatma Gandhi NREGA functionaries to identify and plan the specific interventions.

The bund was strengthened, and new bunds were constructed wherever required, along an 8 km long stretch. The bunds were further strengthened by planting trees. De-siltation work was also carried out through the stretch while reservoirs were constructed in between for storing of water. These works normalized the river flow. The total cost of the project was around INR 1.72 crores.

Since 2021 the region has not witnessed floods due to strengthening of the bunds. The construction of the reservoir has increased the soil moisture and as a result, farmers of the area are taking up other crops in the field near the river, which otherwise remain fallow in Kharif season. **Through these interventions, 1360 acres of land of 1,100 farmers have benefitted.**



18

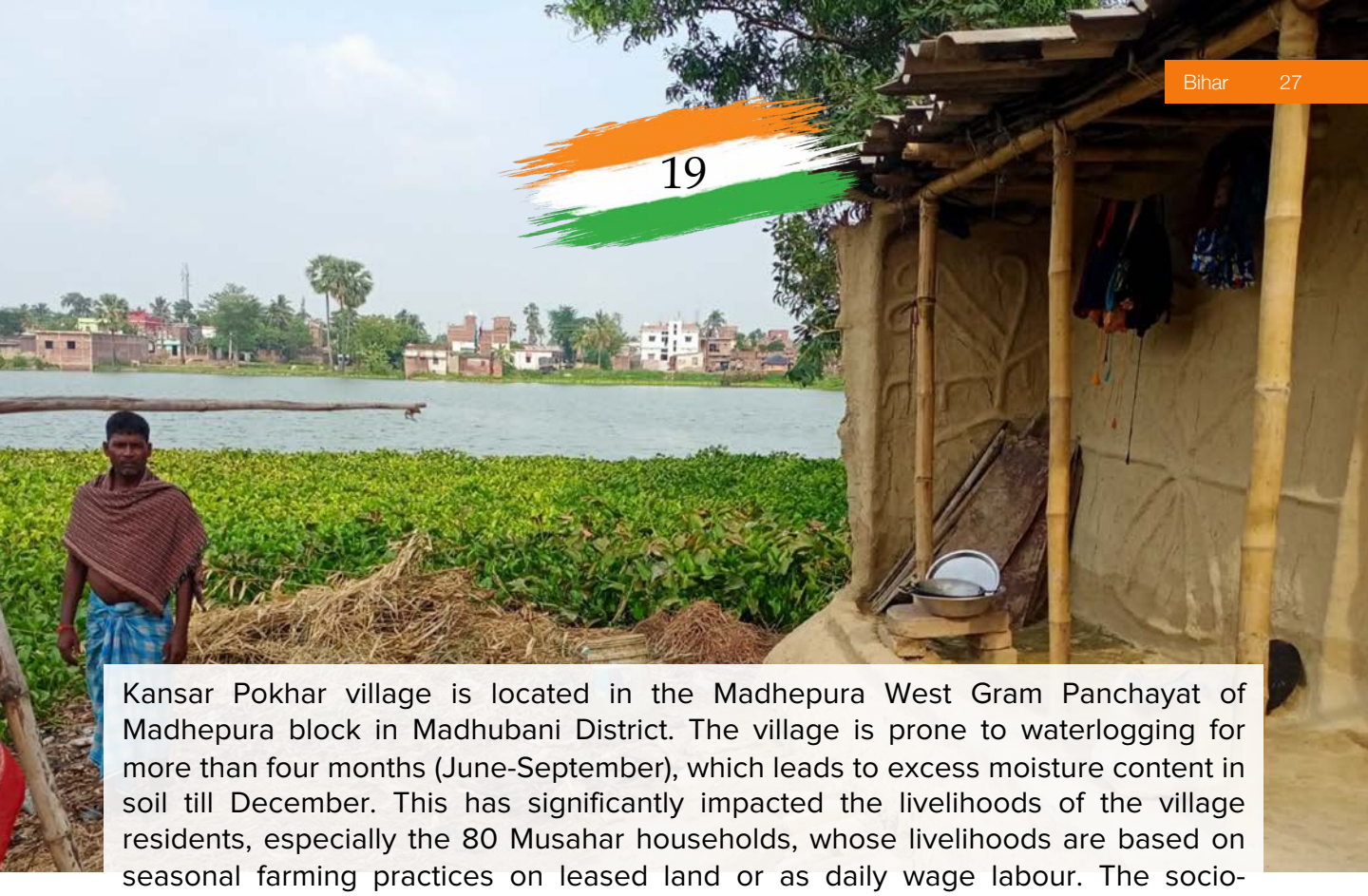
Nalanda is located in South Bihar having partial mountainous terrain, plain land and ridges. The district receives moderate to heavy rainfall. The district spreads over 2355 sq km and has 20 blocks and 249 GP's. The economy of the district is mainly based on cultivation of paddy and vegetables.

The Alawan Gram Panchayat is in the Parwalpur block of the Nalanda district. The local population comprises of small and marginal farmers, for whom agriculture is the primary source of livelihoods. The farmers are dependent on water source from a nearby stream for irrigation purpose. This water stream which is further connected to pynes has dwindled over the years because of the heavy siltation in the pynes (diversion channels or carriers of water from the river).

In response to this challenge, the ICRG team supported the community and the Mahatma Gandhi NREGA functionaries in mapping, planning, and designing of the climate resilient pyne structures. The pyne was designed in accordance to the prevalent geographical slope; water flow in the channel was restored by desilting 4,000 feet of the pyne; and a check-dam was constructed in last valley point of pyne to harvest water. The total cost of the project was around INR 2.9 lakhs.

These interventions have increased retention of soil moisture in the fields, leading to an increase in irrigated area by 22 hectares of land of 134 farmers. This intervention benefits 92 vulnerable families of Alawan Gram Panchayat as well as the residents of the adjoining Shivnagar Gram Panchayat.

19

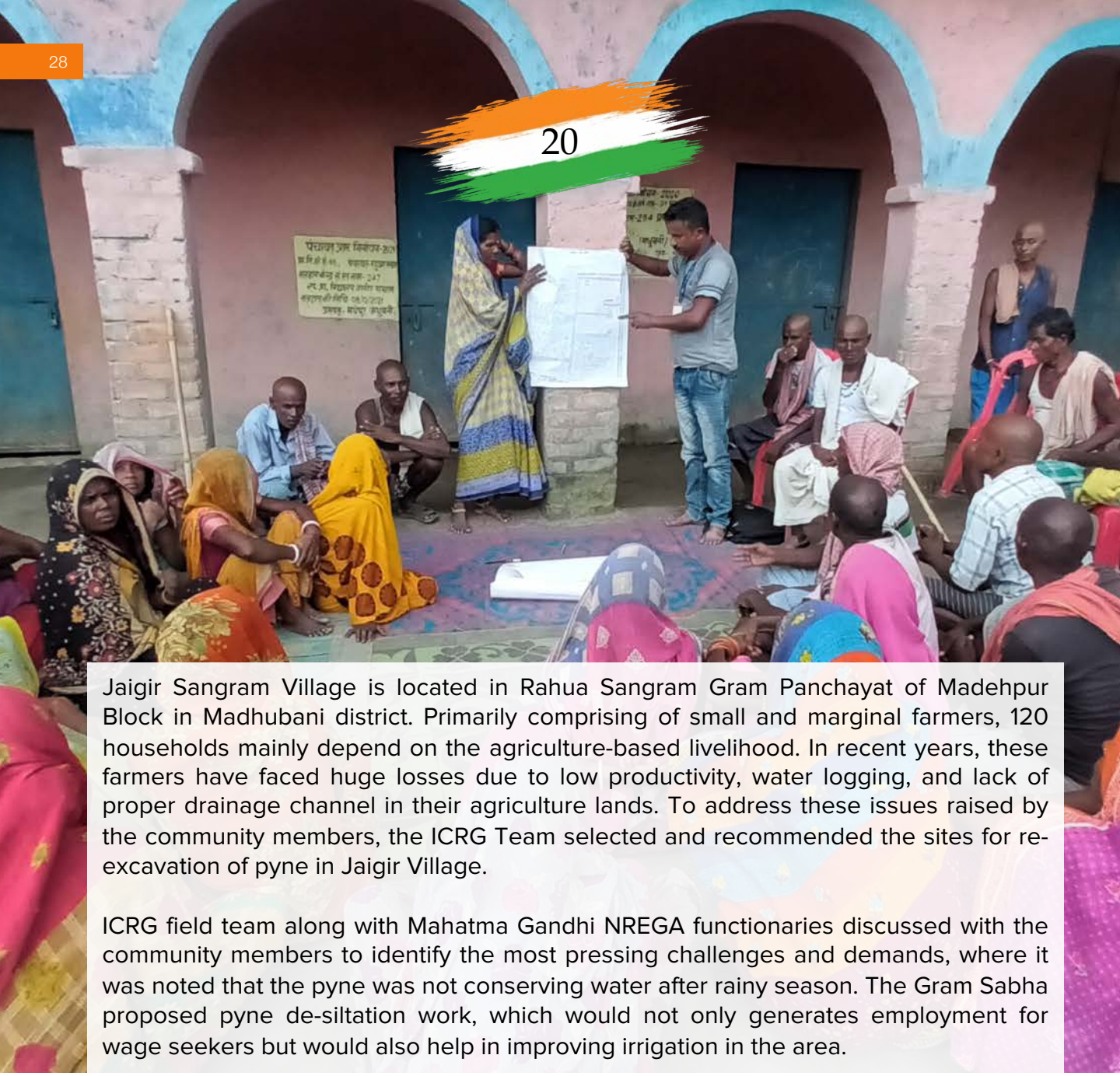


Kansar Pokhar village is located in the Madhepura West Gram Panchayat of Madhepura block in Madhubani District. The village is prone to waterlogging for more than four months (June-September), which leads to excess moisture content in soil till December. This has significantly impacted the livelihoods of the village residents, especially the 80 Musahar households, whose livelihoods are based on seasonal farming practices on leased land or as daily wage labour. The socio-economic impacts extend beyond livelihoods, affecting household settlement, transportation, availability of drinking water, health and hygiene, etc. This is further exacerbated by the reduced retention capacity of village pond and encroachment on the silted irrigation channels.

The ICRG team identified the sites for developing a proper climate resilient plan with active participation of the community and liaison with the Mahatma Gandhi NREGA officials at Block and Panchayat level. Of the total estimated budget for this site of INR 1.2 lakhs, unskilled manpower wages amounted to INR 1.13 lakhs. The team proposed inlet in irrigation channel, which are connected with pond and facilitate discharge of the excess amount of water through the pyne channels during the monsoon season.

It has been observed that the water conservation efforts have increased access to water for irrigation to 20-25 ha of land and also enhanced productivity. Work is also underway on two units of bund plantation on the irrigation channel, with the aim to enhance the asset's durability from climate resilience perspective. **Approximately 50-60 Musahar families who opted for diversified livelihood options, have been linked with various social protection and livelihood schemes.**

"The waterlogging problem got resolved through mobilization and advocacy support coupled with community sensitization on the issue of climate risks. This helped in organizing people and building pressure on key decision makers to address this long-neglected issue."
Meena Devi, ward member, Madehpur west Panchayat, Madhubani, Bihar



20

Jaigir Sangram Village is located in Rahua Sangram Gram Panchayat of Madehpur Block in Madhubani district. Primarily comprising of small and marginal farmers, 120 households mainly depend on the agriculture-based livelihood. In recent years, these farmers have faced huge losses due to low productivity, water logging, and lack of proper drainage channel in their agriculture lands. To address these issues raised by the community members, the ICRG Team selected and recommended the sites for re-excavation of pyne in Jaigir Village.

ICRG field team along with Mahatma Gandhi NREGA functionaries discussed with the community members to identify the most pressing challenges and demands, where it was noted that the pyne was not conserving water after rainy season. The Gram Sabha proposed pyne de-siltation work, which would not only generates employment for wage seekers but would also help in improving irrigation in the area.

Identified climate resilient works were integrated into Mahatma Gandhi NREGA action plan through Gram Sabha. De-siltation was carried out on a total length of 2400 ft of the pyne; a 0-3% slope was maintained every 100 ft from bottom to side; the top width of the pyne was increased from 7ft to 10ft while the bottom width was increased by 3 ft. These interventions facilitated the smooth flow of floodwater and increased the capacity of the pyne to hold water. The total cost of the structure was s INR 4.95 lakhs. **About 60 -70 ha of land are treated by this ICRG intervention.**

"Continuous community engagement, visits and technical support of Mahatma Gandhi NREGA along with ICRG team has helped us to identify the actual problems, its cause and solution which has benefitted our agriculture activities and income."
Community members, Jagir Sangram village, Madhubani, Bihar

Village Chakdah-Pachdahi in Rampur Mani Gram Panchayat is one of the several villages of Sakra Block in Muzaffarpur district where the ICRG programme is being piloted. Over the years the changing rainfall patterns as well as the increasing heat has impacted the productivity from agriculture affecting the small and marginal farmers. Due to lack of opportunities for employment and other enterprises, migration has been a major coping mechanism for the community in this area – especially amongst the landless and the small & marginal farmers.

During the village level consultations while planning for the works under Mahatma Gandhi NREGA, farm-ponds were suggested as a mitigation measure for the marginal farmers. Mr Himanshu Kumar -a marginal farmer with land holding of only about 1.5 acres accepted this solution with the dual purpose of water retention as well as income generation. The ICRG team supported the community and the technical team of Mahatma Gandhi NREGS in identifying the appropriate site for the farm-pond as well provided suggestions on making the structure more resilient and durable through technical inputs like maintaining proper slope, inlet and outlet and bund plantation for slope stabilization.

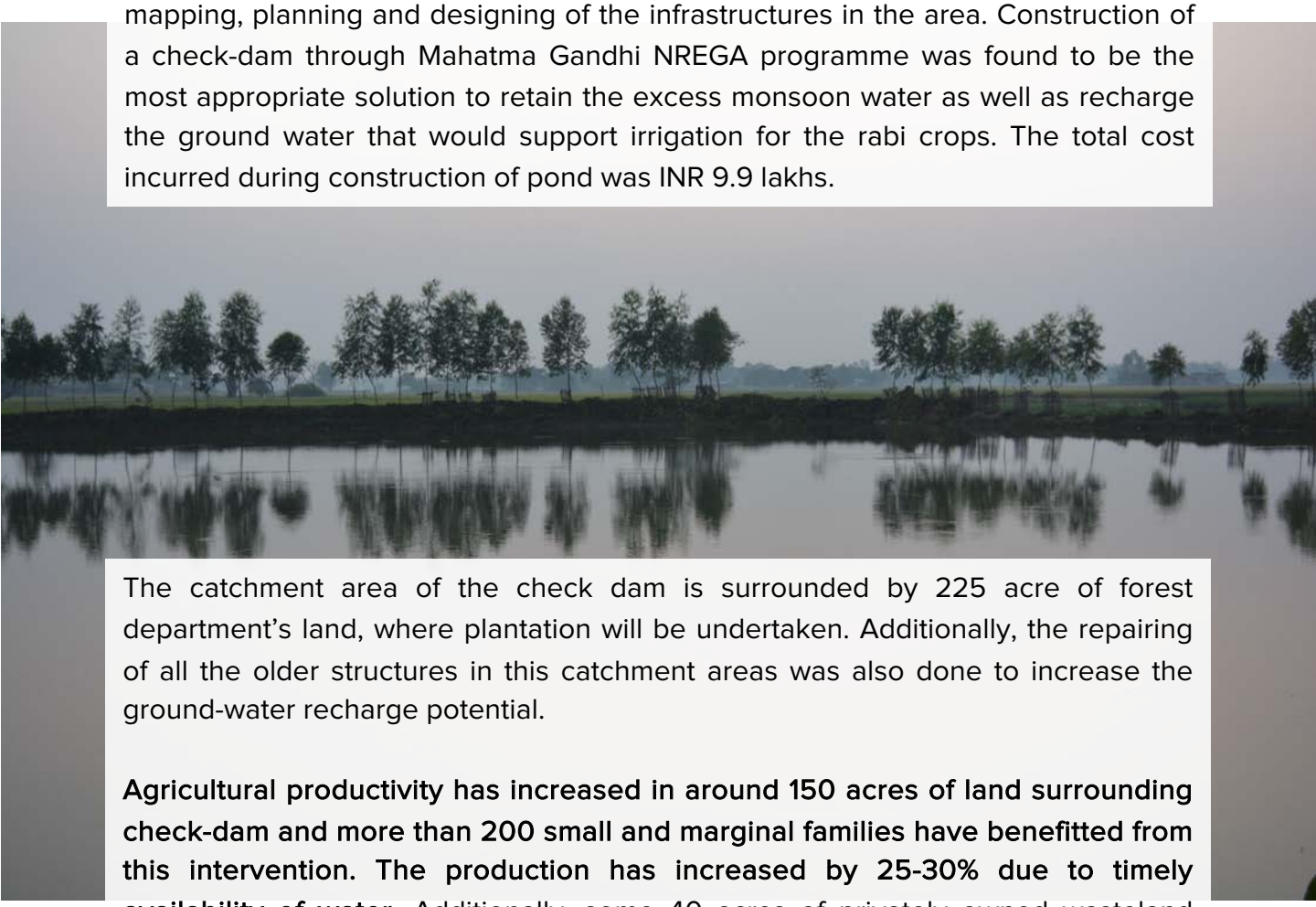
During the construction of this farm-pond about 70 persons from the village got employment. The next step was to link the beneficiary with the fisheries department for capacity building and training on pisciculture. The ICRG team also facilitated the beneficiary to get the correct fish egg along with precautionary measures to sustain the seed. In addition the farmer is also utilising the water from the pond for vegetable farming.

"When I met the ICRG team in a ward Sabha meeting and got to know about the ICRG programme, I shared my idea with them, they fully supported me and they have connected me with fishery training centre. Since then, I have also trained other youth from my village on fishery and allied activities"
Himanshu Kumar, beneficiary, sakra block, Muzaffarpur

22

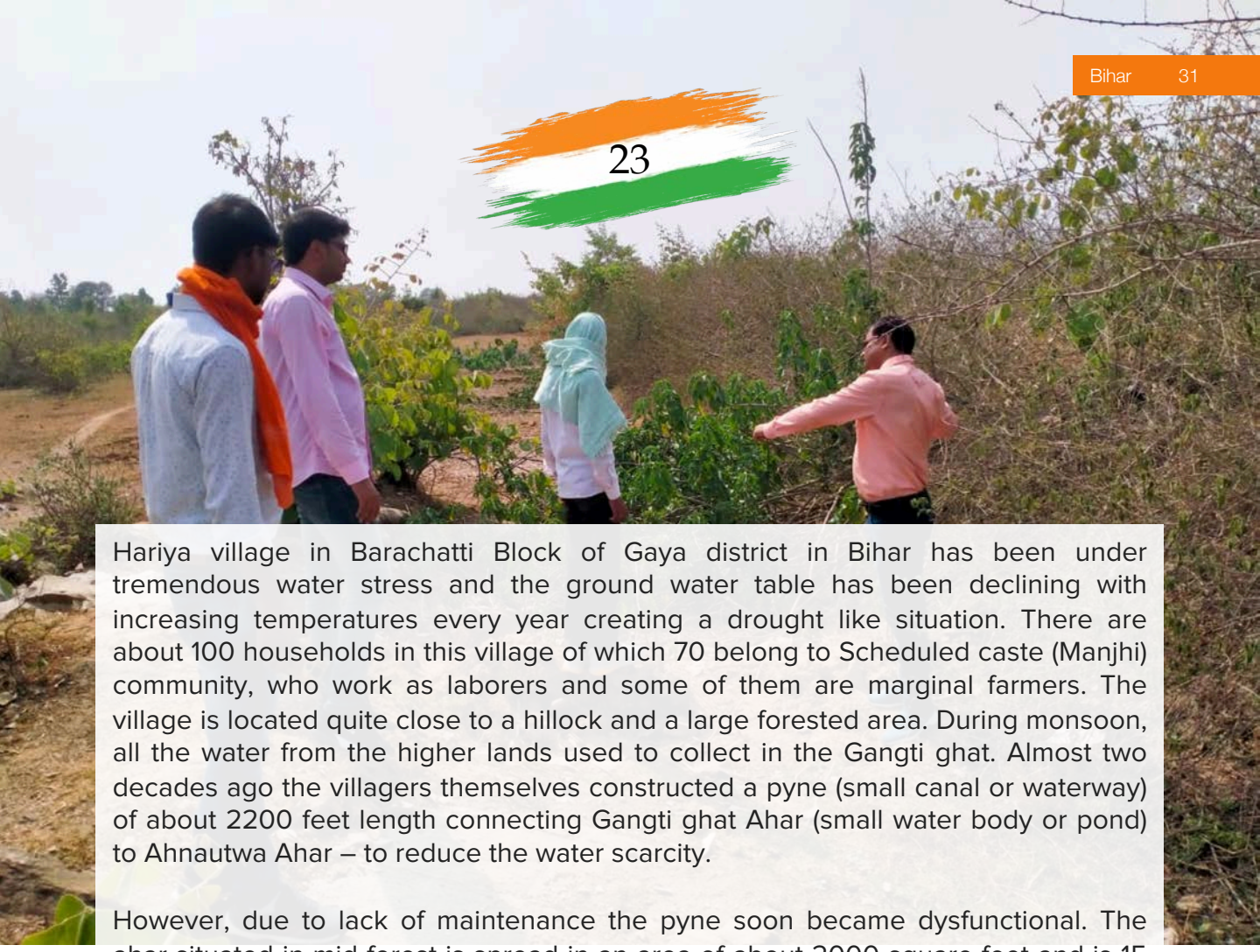
Arwal district is situated in southern part of Bihar with an average annual rainfall of about 1027mm. The principal crops in this district are paddy, wheat and maize. Keyal gram panchayat in Karpi block of this district is primarily inhabited by scheduled caste (SC) community and are mostly small and marginal farmers. Due to the topography of the area, the water during the monsoon drains out – leaving very less water for the rabi crop. This was highlighted as the main challenge during the community consultations for Mahatma Gandhi NREGS work planning.

The ICRG team worked with Mahatma Gandhi NREGS team and the community in mapping, planning and designing of the infrastructures in the area. Construction of a check-dam through Mahatma Gandhi NREGA programme was found to be the most appropriate solution to retain the excess monsoon water as well as recharge the ground water that would support irrigation for the rabi crops. The total cost incurred during construction of pond was INR 9.9 lakhs.



The catchment area of the check dam is surrounded by 225 acre of forest department's land, where plantation will be undertaken. Additionally, the repairing of all the older structures in this catchment areas was also done to increase the ground-water recharge potential.

Agricultural productivity has increased in around 150 acres of land surrounding check-dam and more than 200 small and marginal families have benefitted from this intervention. The production has increased by 25-30% due to timely availability of water. Additionally, some 40 acres of privately owned wasteland belonging to the SC community is also slowly being converted to agricultural land, which is strengthening the livelihoods of these vulnerable families. To further improve the agricultural productivity, these farmers have been linked with the Agricultural Department for provision of better quality seeds and training on improved agricultural practices.



23

Hariya village in Barachatti Block of Gaya district in Bihar has been under tremendous water stress and the ground water table has been declining with increasing temperatures every year creating a drought like situation. There are about 100 households in this village of which 70 belong to Scheduled caste (Manjhi) community, who work as laborers and some of them are marginal farmers. The village is located quite close to a hillock and a large forested area. During monsoon, all the water from the higher lands used to collect in the Gangti ghat. Almost two decades ago the villagers themselves constructed a pyne (small canal or waterway) of about 2200 feet length connecting Gangti ghat Ahar (small water body or pond) to Ahnautwa Ahar – to reduce the water scarcity.

However, due to lack of maintenance the pyne soon became dysfunctional. The ahar situated in mid forest is spread in an area of about 2000 square feet and is 15 feet deep but due to the unfunctional pyne, water from one ahar to another ahar is not being transferred and is lost. Following community consultations during the village meeting for development plan (GPDP), the construction of this pyne has been registered as one of the priority works under Mahatma Gandhi NREGS. The ICRG team provided technical inputs to the design elements of the pyne to make it low maintenance and also increase its useful life, considering the changing climate.

This intervention would not only help Hariya and other adjacent villages in increasing their agricultural incomes but also generate work-days for the local Mahatma Gandhi NREGA job card holders.

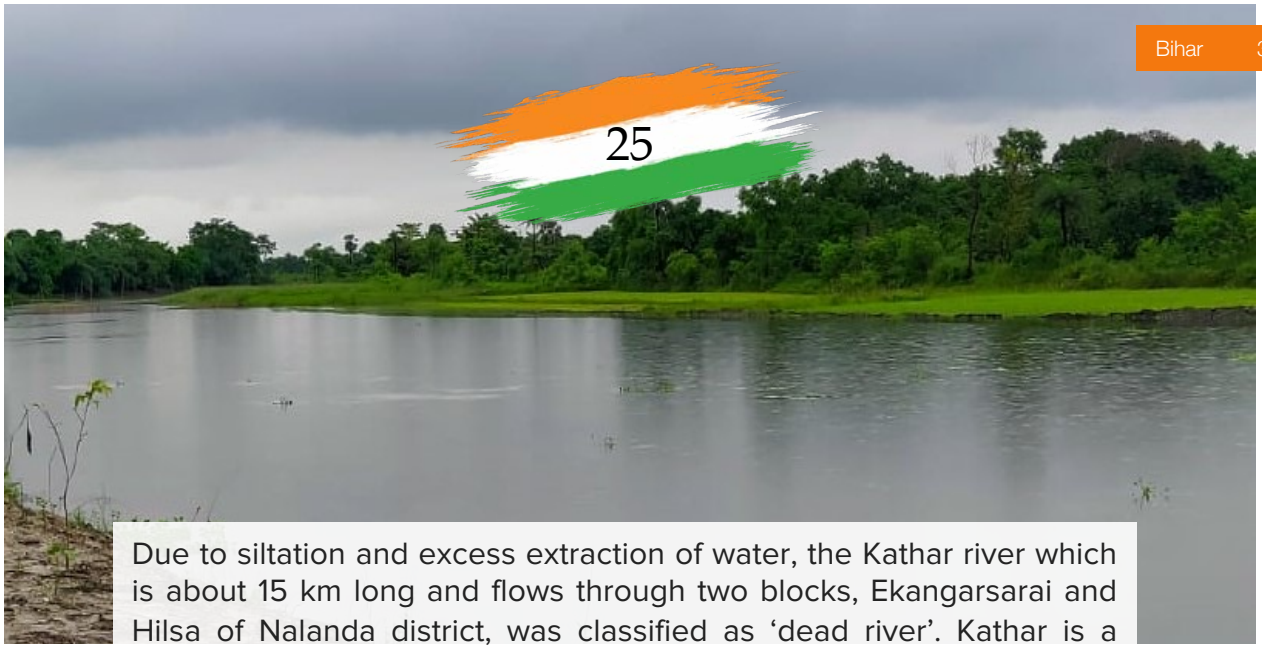
"Almost two decades back, the community here had made a pyne from Gangati ghat Ahar to Ahnautwa Ahar by Shram Dan (self labour) to fetch the water for farming and household work, but it became non-functional. The ICRG team made us aware about climate resilient structures – which incentivized us to raise the issue in Aam Sabha (general assembly) and Gram Sabha (village assembly). The ICRG team also helped us with the process to register this critical structure in the Gram Sabha and also in Mahatma Gandhi NREGS for work-site. This initiative will have great positive impacts on the livelihood of the Manjhi community and enhance the community's resilience."
Vikas Manjhi, active member of Manjhi community

24

Returning migrants workers during the second wave of COVID 19 faced the challenge of scarce livelihoods in their villages. In April 2021, about 150 migrant workers returned from cities like Delhi to Nawada Gram Panchayat of Madehpur block in the Madhubani district. ICRG team along with the PRI members arranged for testing and quarantine of these workers . Several of these returning migrant families had their job cards but had never worked earlier in Mahatma Gandhi NREGS.

The ICRG team through its ground level presence, persuaded the gram panchayat secretary to initiate some works under the Mahatma Gandhi NREGS – so as to help these migrant families with wages. Many from these migrant family members were thus engaged in the works like road construction in the panchayat. The workers were briefed on personal hygiene and safety measures for COVID 19 Prevention by the Panchayat Coordinator and the village head also provided them free masks. A total of 350 families benefitted during the difficult time of pandemic.

"We were hesitant of engaging these workers due to fear of spread of infection as they had returned from cities with high infection cases. However with proper quarantine, check-ups and facilitating support from the ICRG team increased our confidence and we were able to engage them in the Mahatma Gandhi NREGS works. We will ensure that the families receive free ration as well in the next two months as announced by the government."
Priyanka Pandey, Village Head, Nawada Gram Panchayat



Due to siltation and excess extraction of water, the Kathar river which is about 15 km long and flows through two blocks, Ekangarsarai and Hilsa of Nalanda district, was classified as 'dead river'. Kathar is a tributary of Falgu river and used to have a perennial flow and was once major source of irrigation and water recharge for the area. About 3250 families of 12 villages along the river, belonging to vulnerable communities and low-income groups were dependent on this river and cultivated vegetables. As the water availability from this river reduced, the farmers in this region turned to subsistence farming which was not enough for livelihood and this resulted in higher migration from these villages to town and cities in search for alternate employment.

A composite plan of a series of Mahatma Gandhi NREGS works was devised to rejuvenate this dead rivulet which included construction of check dams, farm ponds and strengthening of embankments. The ICRG team developed the detailed DPR for the river rejuvenation which also included huge amount of de-siltation. Since the quantum of de-siltation was large, the Minor Irrigation Department provided was approached for convergence. Several large works like de-siltation, strengthening the river bund were taken up by the Minor irrigation schemes whereas works like plantation on the river bund work and on the adjoining pynes, farm-ponds, etc. were taken under the Mahatma Gandhi NREGS. This kind of convergence between the two departments on rejuvenating the 'dead' river has become an example for the state and is being replicated. The total cost of the project was around INR 1.26 crore.

This intervention has benefited more than 3200 farmers households with increase in the water availability for irrigation. Improvement in productivity of Rabi crop and vegetable cultivation is reported from more than 1500 ha of agricultural land, increasing the income of the farmers by about 30% - 50%. The river rejuvenation initiative also facilitated about 16 km of linear plantation and approximately 20 ha of block plantation.

26

Jahangir village of Rohi Gram Panchayat in Barachatti Block, Gaya district was severe water problems due to depleting ground water table. Water from the hills and nearby forests get collected in the ponds thorough the pynes. This has been a major source of irrigation for more than 50 farmers in the village and approx. 150 farmers spread in three villages namely Mayapur, Darbar and Ghat Bigha. Over time, the pond which is spread over 100 feet by 70 feet, has gone dry due to excessive sedimentation resulting in reduced water holding capacity. There is also an Aahar near the pond which connects to 1.5 km pyne benefitting the three villages.

During the community meeting with the villagers the issue of decreasing water table in the area was discussed with the ICRG team. Water from the pond was widely used in irrigation and other purposes but over the last ten years it has dried up resulting in reduced irrigation and agricultural production. Rejuvenation and restoration of pond was discussed and proposed in the meeting as this will benefit in irrigation as well as undertaking fishery as an alternative livelihood option by the villagers. Consistent effort by the Gram Panchayat members ensured incorporation of the development and restoration of this pond under the Mahatma Gandhi NREGS action plan.

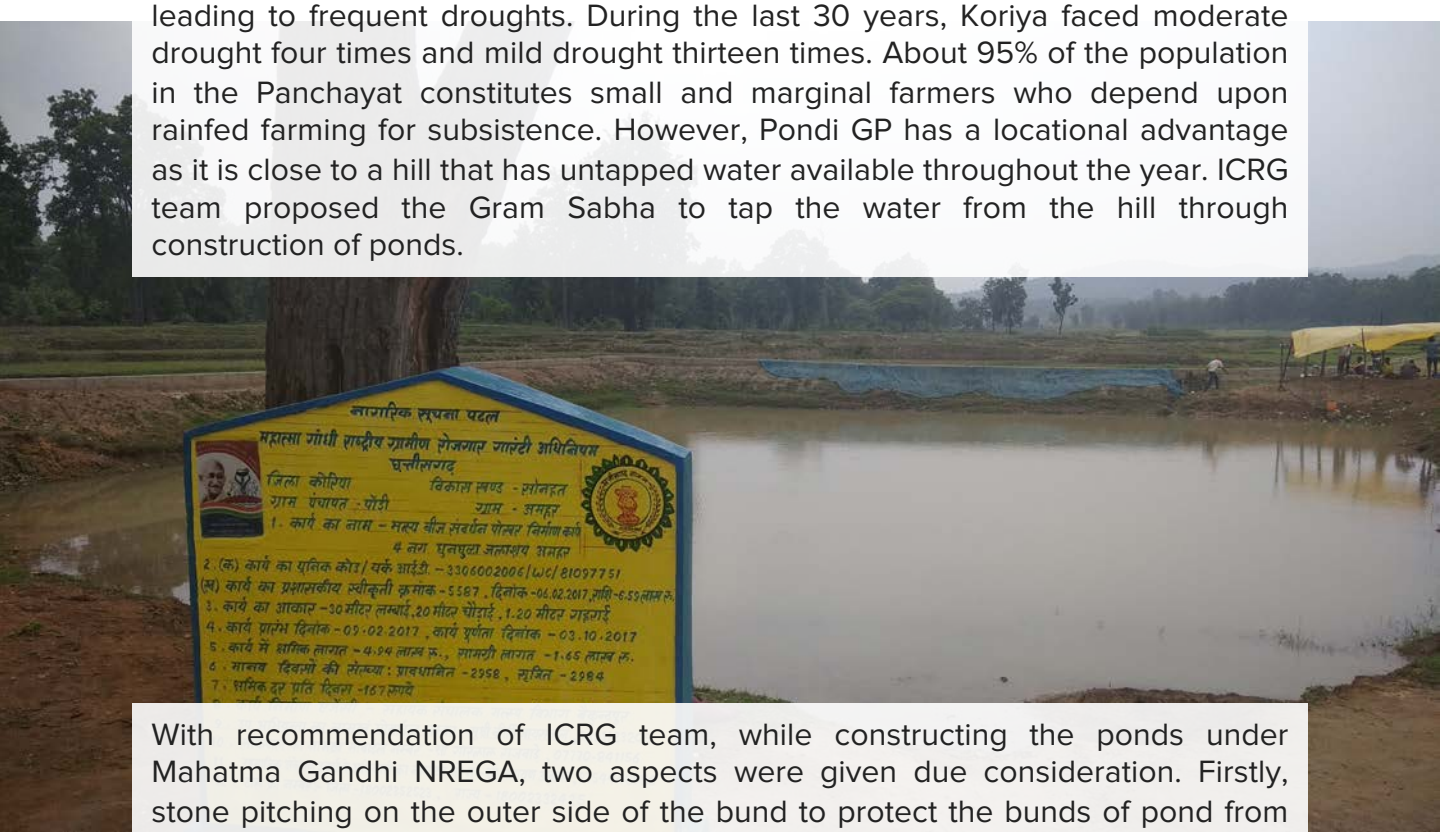
Under the technical guidance from ICRG, the plan was developed with PRI members and villagers which included excavation, water outlet construction connecting with ahar and plantation around the pond. Community members have agreed to undertake fishery in the pond once the pond is rejuvenated. **The estimated water recharge potential from the pond is about 1500000 kl per year. Water from the pond helps irrigate approximately 15 hectares of land in the area.**

"The participatory community engagement has not only raised the issue but also become sensitive towards climate risks and mitigation action plans. Many of the women leaders are coming forward to be part of this climate resilience process in our villages."
Manu Devi, President of the CBO in the village Jahangir Village.


CHHATTISGARH

27

Pondi Gram Panchayat comes under the Koriya district of Chattisgarh and is dominated by tribal communities like Kols, Gonds and Pandos. The district faced severe water scarcity in the past despite having hills and good forest cover, leading to frequent droughts. During the last 30 years, Koriya faced moderate drought four times and mild drought thirteen times. About 95% of the population in the Panchayat constitutes small and marginal farmers who depend upon rainfed farming for subsistence. However, Pondi GP has a locational advantage as it is close to a hill that has untapped water available throughout the year. ICRG team proposed the Gram Sabha to tap the water from the hill through construction of ponds.

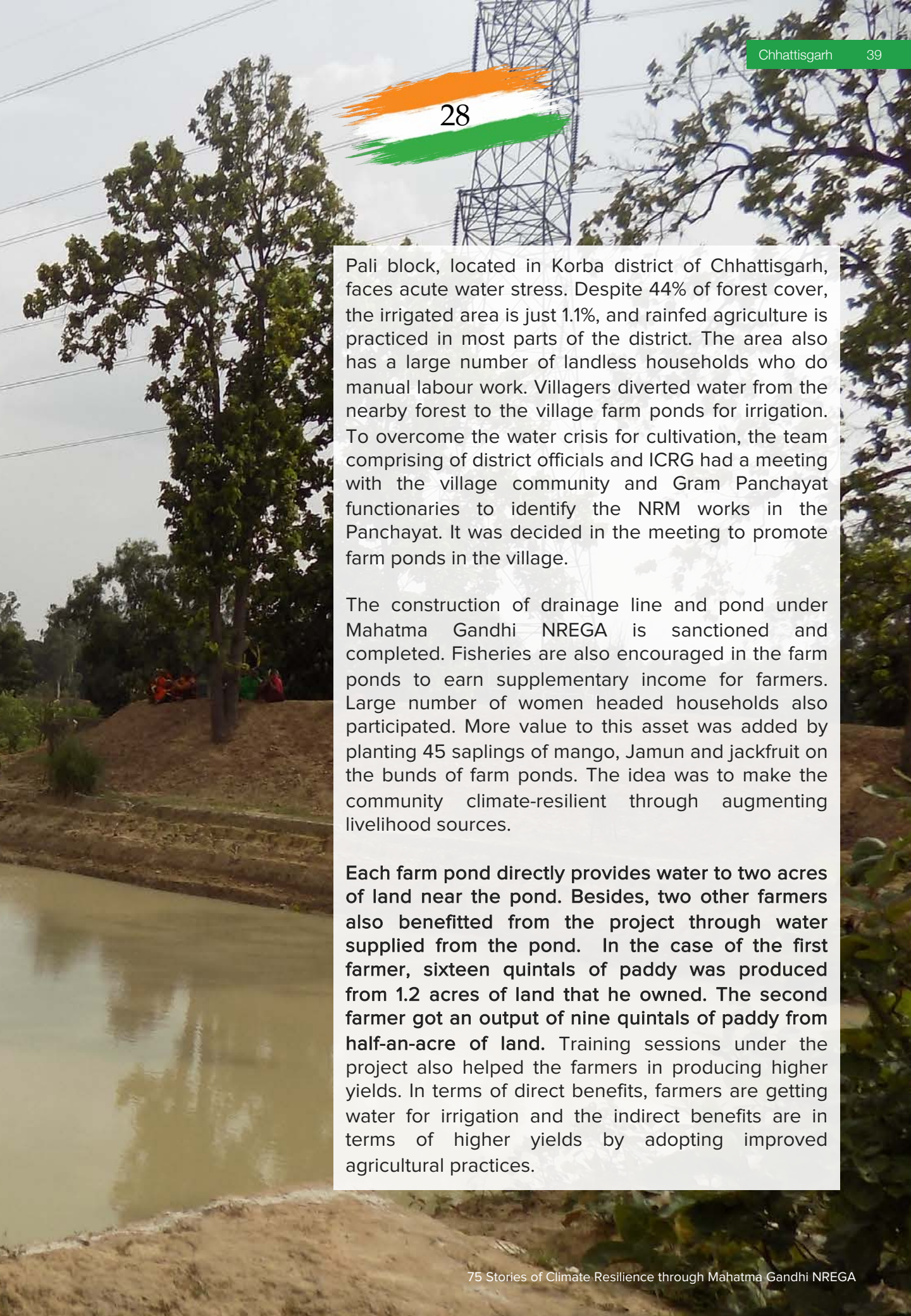


With recommendation of ICRG team, while constructing the ponds under Mahatma Gandhi NREGA, two aspects were given due consideration. Firstly, stone pitching on the outer side of the bund to protect the bunds of pond from soil erosion and secondly, inlet and outlet of the pond were built to regulate optimum water flow into the fish rearing pond. A targeted livelihood convergence plan was prepared to link beneficiaries to various agriculture schemes and financial services of the government like seed distribution, credit card, soil health card, horticulture plantation and irrigation, pump installation, etc. Around 190 farmers received System of Rice Intensification (SRI) training in different methods for vegetable cultivation and Livestock management in the rainy season from Krishi Vigyan Kendra.

Direct benefits from the fish rearing pond accrued to 31 tribal households. They have formed a cooperative called "Om Shiv Machuwa Sahakri Samiti Maryadit- Amhar group" and registered under Societies Registration Act. The hatchery can produce 16 lakh fingerlings annually.

"We were also given the charge of doing pisciculture in the Ghunghutta dam and nearby ponds. All put together, about 480 metric tons of fish is expected to be produced in a year."
Member, "Om Shiv Machuwa Sahakri Samiti Maryadit- Amhar' cooperative group

28



Pali block, located in Korba district of Chhattisgarh, faces acute water stress. Despite 44% of forest cover, the irrigated area is just 1.1%, and rainfed agriculture is practiced in most parts of the district. The area also has a large number of landless households who do manual labour work. Villagers diverted water from the nearby forest to the village farm ponds for irrigation. To overcome the water crisis for cultivation, the team comprising of district officials and ICRG had a meeting with the village community and Gram Panchayat functionaries to identify the NRM works in the Panchayat. It was decided in the meeting to promote farm ponds in the village.

The construction of drainage line and pond under Mahatma Gandhi NREGA is sanctioned and completed. Fisheries are also encouraged in the farm ponds to earn supplementary income for farmers. Large number of women headed households also participated. More value to this asset was added by planting 45 saplings of mango, Jamun and jackfruit on the bunds of farm ponds. The idea was to make the community climate-resilient through augmenting livelihood sources.

Each farm pond directly provides water to two acres of land near the pond. Besides, two other farmers also benefitted from the project through water supplied from the pond. In the case of the first farmer, sixteen quintals of paddy was produced from 1.2 acres of land that he owned. The second farmer got an output of nine quintals of paddy from half-an-acre of land. Training sessions under the project also helped the farmers in producing higher yields. In terms of direct benefits, farmers are getting water for irrigation and the indirect benefits are in terms of higher yields by adopting improved agricultural practices.

29

Bharari Gram Panchayat is located in Bilaspur district of Chhattisgarh. A vast majority of workers belong to backward communities. Due to shortage of water, farming saw a gradual slowdown in the village. During a community meeting, it was decided to resolve the problem of water scarcity by constructing cascading ponds in the Gram Panchayat.

With the technical assistance from ICRG, this work has been planned and implemented as climate resilient work (CRW) based on climate science and integrated natural resource management approach along with parameters of durability, inclusion and livelihood diversification. Two different works viz. construction of the feeder channel and de-siltation of the community ponds, were taken up to address the issue of water stress. The feeder channel was constructed through financial convergence of three different schemes (40% from Mahatma Gandhi NREGS, 20% from 14th Finance Commission and 40% from Gram Panchayat). The district administration undertook plantation on the bund in convergence with the forest department. Under this project, 500 seedlings were planted on the bunds of the community ponds along with tree guards.

The interlinking of community ponds in the Bharari Gram Panchayat of Bilaspur district has increased the storage capacity of the ponds due to channelization of run-off water. This has also enhanced the water harvesting capacity by 25-30%. The storage of water in the ponds has increased the groundwater recharge in the aquifer. In addition to meeting the drinking water needs of the people, 25 households are using the stored water for irrigation during Kharif season. Under normal weather conditions, water is also used to irrigate 8 ha of land during Rabi season. Villagers also benefitted from the community pond by using it for domestic purposes throughout the year.

"Now we are getting sufficient water for domestic use and cultivation. The villagers are very positive about the outcome of the scheme".
Shri Behai, beneficiary

"Before the water conservation project, I had to carry water from a long distance. Now, water is available during summer and also for meeting our domestic needs. I am happy with the outcome."
Smt. Kavita Suryawanshi, beneficiary

30

Most of Chhattisgarh's rural landscape is criss-crossed by small streams that collectively form tributaries to join a river. One such tributary is Kodharya which flows across the Surajpur district. In the Salka Gram Panchayat of Premnagar block in Surajpur district, soil erosion, drying up of water bodies and ground water level depletion–all of which are related to the changing and unpredictable climate–are common problems here. The Surajpur District Administration with the support of ICRG team ran a pilot project that allowed scientific planning and quality assurance of NRM works under Mahatma Gandhi NREGA. **This has helped the district effectively utilise more than 85% of funding under Mahatma Gandhi NREGA on NRM works in the last three years.**

The gully plugs with an assortment of check dams and stop dams are placed to serve two purposes, firstly it slowed down the speed of the water and secondly it has controlled the direction of the flow. As the water slows down, it erodes less soil and also allows more ground water recharge.

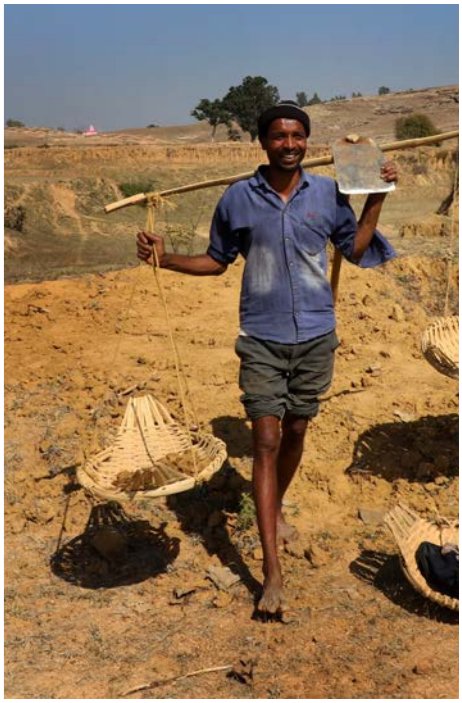
At the last point of the Kodharya, a stop dam has been constructed with an aim to prevent the water from flowing away and therefore to fulfil the need of water in the area, especially for irrigation purposes.

"I was able to convert my entirely barren landscape into productive, cultivable patches of land by following the ICRG recommendations of using the 30/40 method. The entire process took about long time to showcase results. I'm presently cultivating a mango plantation."
Maan Singh, Marginal Farmer, Salka Gram Panchayat

31

Adjacent to the Salka Gram Panchayat are the Chandrapur and Chindiya Gram Panchayats in Surajpur district. Like most of Chhattisgarh, Chandrapur also witnesses a prolonged break during the monsoon season that is rooted in climate change. Gram Panchayats were trying to ensure that farmers would have enough water to keep irrigating their lands. The ICRG team was consulted during the construction of two farm ponds and one dug well under Mahatma Gandhi NREGA.

The support from state government's flagship programme Naruwa, Garuwa, Ghurwa, Bari, which focuses on restoration of drainage systems of rivers under the Naruwa component was also utilised. Villages like Chandrapur took the lead and set an example where a large number of structures were required and almost one-fourth of the households in the village have members who are completing more than 100 days of wages in a year since the last two years in a row.

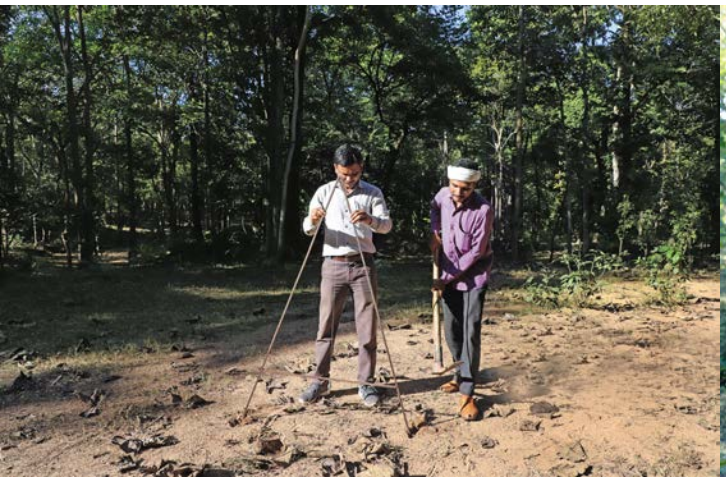


"I am an individual earning livelihood by participating in the construction of the climate resilient structures under Mahatma Gandhi NREGA."
Arjun Rajwade, Beneficiary, Mahatma Gandhi NREGA

"I supplemented my agricultural income by being employed under Mahatma Gandhi NREGA for the construction of the various climate resilient structures across the Kodharya tributary in the Salka region."
Harinandan Rajwade, Beneficiary, Mahatma Gandhi NREGA

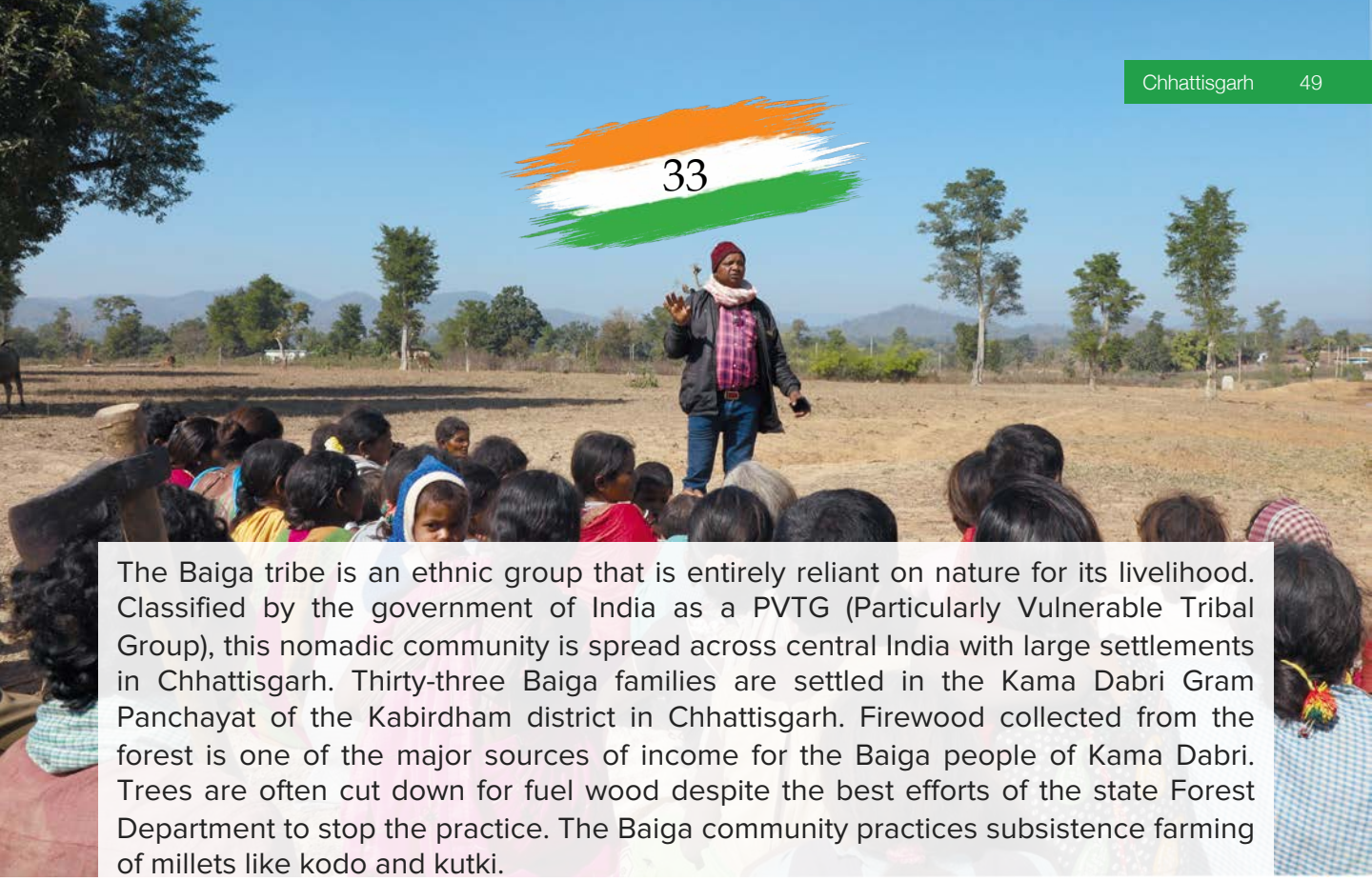
32

The Gariaband Forest is a rich landscape of natural resources partly located in the Gariaband district – one of the nine new districts formed by the Chhattisgarh state government in 2012. The ICRG programme collaborated with the State's Compensatory Afforestation Fund to integrate climate resilient works in the planning and implementation of conservation efforts (soil and water) that are underway in the forest. This collaboration has resulted in the training of forest officials on the application of GIS assisted tools, and officials from the State Forest Department have prepared detailed project reports on 137 naruwas (streams).



Small and medium sized streams flow throughout the Gariaband forest region, carrying with them runoff that not only erodes the soil, but also deposits silt across the forest floor. To mitigate the problem, construction of silt traps, brush root check dams and loose boulder check dams were constructed under Mahatma Gandhi NREGA. The structures are not just beneficial to the forests and to the farmers linked to these streams but also with Mahatma Gandhi NREGA supporting climate resilient designs recommended by the ICRG programme, both wages and livelihoods have improved.

An A-Frame is used to accurately map out markings used for the construction of climate resilient structures across the forest floor. Each structure is marked out on a tree nearby in red – a first for the Forest Department as the only markings used on trees before were to notify which trees had to be cut. These markings in red contain all the relevant information about each structure that has been created.



33

The Baiga tribe is an ethnic group that is entirely reliant on nature for its livelihood. Classified by the government of India as a PVTG (Particularly Vulnerable Tribal Group), this nomadic community is spread across central India with large settlements in Chhattisgarh. Thirty-three Baiga families are settled in the Kama Dabri Gram Panchayat of the Kabirdham district in Chhattisgarh. Firewood collected from the forest is one of the major sources of income for the Baiga people of Kama Dabri. Trees are often cut down for fuel wood despite the best efforts of the state Forest Department to stop the practice. The Baiga community practices subsistence farming of millets like kodo and kutki.

The ICRG team oriented the community about the impacts of climate change on their livelihood. The team was able to mobilize the community in building two climate resilient structures under Mahatma Gandhi NREGA. With the support of ICRG, an earthen dam that stops the water from flowing downstream with surface runoff (thus preventing soil erosion), and a community pond that is used for fishing and domestic purposes. Water that is held in the dam also serves to fulfil multiple community needs, mostly domestic.

Small farmers like Titra Singh in the Kama Dabri area are able to provide lifesaving irrigation to their crops during the dry spell in the monsoon that occurs due to climate change.

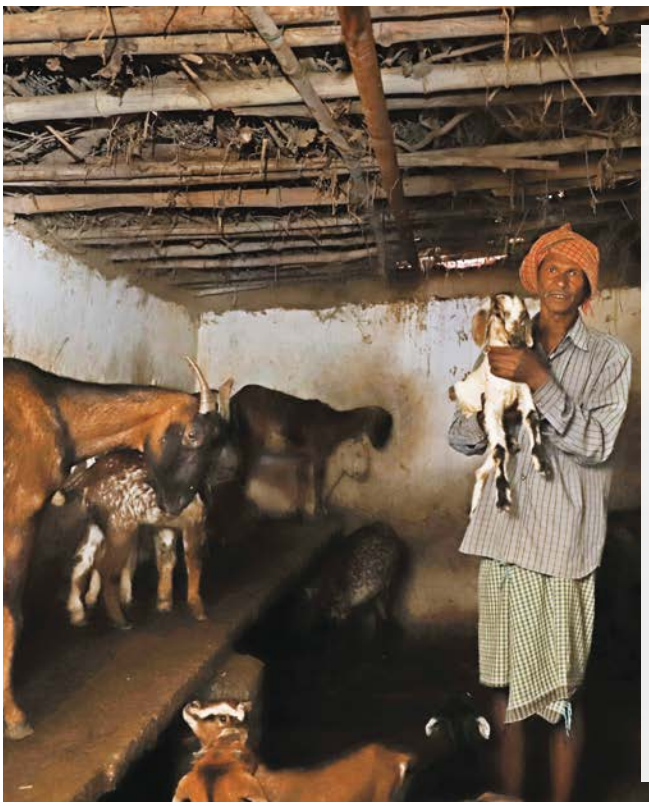
"For three years, I saw my efforts going waste as the crop would dry out and die. But thanks to this Mahatma Gandhi NREGA through which a farm pond was being made, that's not the case anymore."
Titra Singh, Farmer, Kama Dabri Gram Panchayat

Similarly, Arjun Dhurve no longer has to depend upon a nearby stream. But with a dug well built on his land now, Arjun has an asset that allows him to water his field with ease, and also cultivate an additional crop cycle with the well water accumulated for an extended time period even after a short period of rainfall.

"It was difficult to water my field as logistics didn't allow me to do so in one go; hence I had to do it in instalments. Also I could only grow one crop cycle in the season."
Arjun Dhurve, Farmer, Kama Dabri Gram Panchayat

34

Not too far away from Kama Dabri is the Dani Ghatoli Gram Panchayat of the Kabirdham district where livestock farmers like Ankalaha faced a monumental problem of high mortality rate for his goats that would often fall sick due to bad hygiene conditions. The problem was resolved with the construction of a goat shed constructed under Mahatma Gandhi NREGA technical guidance of the ICRG team.



The ICRG team recommended interventions that have helped farmers with climate resilient structures that have improved both agriculture and livestock conditions. As moisture and sludge carry infections that are lethal to goats, the shed makes use of the nature of goats to rest on higher ground and prevents them from coming into direct contact with the sources of infections, this has proved very beneficial for Ankalaha.

"The shed is basically a raised platform that allows the goats to rest above the ground, where moisture may not affect their health."
Ankalaha, Beneficiary, Mahatma Gandhi NREGA

35

At Rajnandgaon district's Barbaspur Gram Panchayat, farmers were facing water a crisis due to water runoff from a nearby stream. Villagers took up the issue with the Gram Panchayat. With due deliberation Gram Panchayat approved the work of the check dam. The ICRG provided technical assistance to the Mahatma Gandhi NREGA functionaries during the construction of the check dam. The team applied participatory rural appraisal (PRA) tools like resource mapping, social mapping and prepared seasonality of employment to develop the collective understanding of issues and options for NRM work.

After the check dam was built to help farmers cultivate in the kharif season, one of the beneficiaries Nirmala Sahu is able to irrigate her land despite shortage of rainfall. The check dam irrigates her crops till February.

"I have been taught by the engineers of the ICRG team that efficient irrigation can happen with the use of sprinklers. For me, they act as an additional source of income as I rent them for Rs 500 per day within the community."
Nirmala Sahu, Farmer, Barbaspur Gram Panchayat

Further adding to the cause, a community pond built under Mahatma Gandhi NREGA ensures consistent supply of water for domestic uses to the local community.

"From my first interaction with the village stakeholders, we've come a long way as earlier I had a hard time even convincing them about the existence of climate change. But through persistence and with results, we are like a family—helping each other."
Megha Rani, a community mobiliser in Rajnandgaon who looks after five Gram Panchayats and eight villages.

36

Deogarh panchayat is 20 km east of Tamnar block in Raigarh district. In the last one decade the block has seen the opening of several industries and coalmines. Inward migration, transportation, and setting-up of several ancillary industrial units created jobs and better-paid labour opportunities by replacing traditional livelihoods of this area. But all these livelihood activities in the area came to sudden halt and people had to remain indoors with the surge in COVID 19 cases. The plight of the panchayat was brought into the notice of district administration. ICRG team was involved in community preparedness for migration influx and to deal with the situation of Covid19 crisis.

Being a rainfed area, the people practiced single crop in the Kharif season. Out of the total geographical area of 465Ha only 206Ha land is used for agriculture. To address the COVID situation, sufficient number of works would have to be taken up to give employment to a large number of people. The ICRG team facilitated the Gram Sabha to prepare a list of such works under Mahatma Gandhi NREGA which was accepted by the district administration. After due verification, 66 NRM related Community and Individual works were sanctioned and initiated that include: 46 Gabion structures, eight open well and eight land levelling works.

The impact of the works was that 367 labourers were provided work and this provision of work is an 150 % increase as compared to normal years. Over 10 thousand work days have been created. This would also have positive effect on water table situation of the area, soil moisture content and improvement in irrigation facilities to the beneficiary households during the dry spells in the monsoon as well. In some cases these structures have helped them to take double crops in the Rabi season.

37

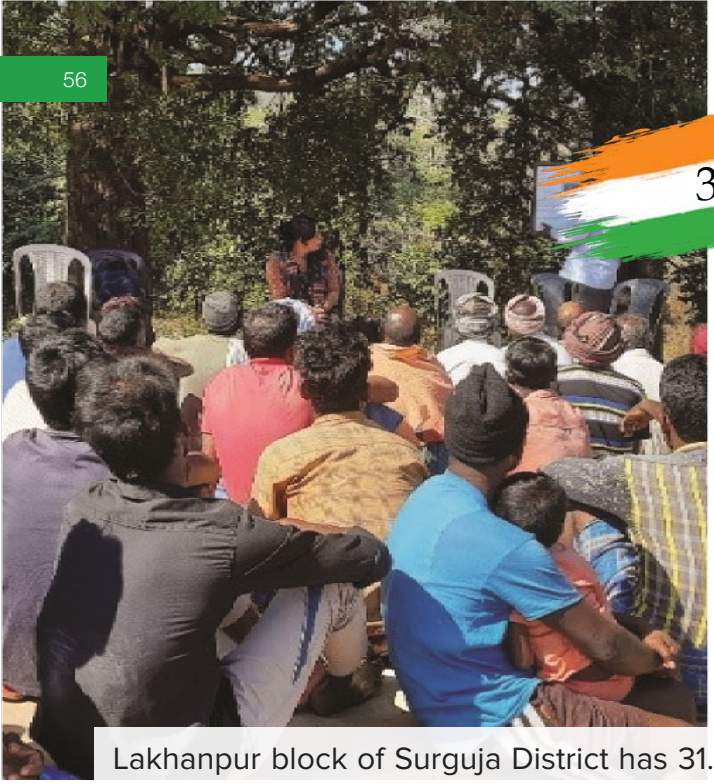
Pandariya is one of the four blocks of Kabirdham district that falls under the rain shadow region of Maikal mountain ranges of Satpura. As per the vulnerability assessment report (Ricardo, 2017), Pandariya will be “highly” vulnerable to drought events in future. Similarly in Kamthi Gram Panchayat of Pandariya block, water scarcity issues further increased with frequency of drought which was severely affecting the livelihoods and income of the vulnerable households.

ICRG team recommended the climate proofing of Mahatma Gandhi NREGA assets by incorporating climate resilient features. The foremost objective was to provide irrigation facilities during the dry spell of the monsoon season in the area. It is also important to undertake diversified livelihood practices which can provide sustainable livelihood income.

Sameet Kumar, a 29 year old, community member undertakes farming as well as unskilled wage labour under Mahatma Gandhi NREGA.

“I have three acres of land and used to harvest around 9-10 quintals of paddy per acre whereas after the construction of a well I have harvested 14-15 quintals of paddy from one acre of land by doing line sowing. During the pandemic period, I decided to concentrate on vegetable cultivation in maximum area and paddy only in a small area to earn more money which can be used at the time of crisis.”
***Sameet Kumar, Farmer,** Kamthi Gram Panchayat*

38



Lakhanpur block of Surguja District has 31.5 % of forest cover and 81 % of un-irrigated agricultural land in which agriculture is completely dependent on rain water. Almost 95 % of the population here have a monthly income less than INR 5000/-. Since Lakhanpur has 51 % of tribal population including 14.5 % FRA beneficiaries, so the struggle of ST's for the recognition of their Individual Forest Rights and Community Forest Rights over forest land was pertinent. To recognise these efforts for 13 Gram Panchayats that come under the IFR and CFR 20 – construction of soil and water conservation works like land development, farm ponds, etc. were initiated under Mahatma Gandhi NREGA. The foremost objectives of the plan are to increase the flow of water by a few months and to increase the ground water table, with the ultimate aim of increasing crop productivity by assured irrigation facilities and to provide sustainable diversified livelihoods.

The ICRG team provided capacity building training to the technical staffs of the Naruwa restoration programme. Around 1396 technical officials from Mahatma Gandhi NREGA and forest department were trained by IRCG team. The team developed the people centric Naruwa plan on the principles of watershed approach through GIS interpretation and considering the needs of the people. Some of the area treatment works related to Soil and Water Conservation are 358 Farm Ponds, 45 Percolation tanks, 38 Open Wells, 154 Recharge Pits, 45 ha land with 30-40 model, 250 drainage line treatment works with brushwood check dam, 158 Earthen Gully plugs, 558 LBCD, and 42 Gabion structures, etc.

The total work generated 957077 person days. Approximately in one year it provided employment to 2720 active job cards for 117 days in 20 GPs. The long term impacts that is expected over a period of three to four years will be that land erosion treatment area would increase by 4530.5 Ha and irrigated area would increase by 285.5 Ha. Plantation area would increase by 112 Ha with new 44800 plants of forestry species and the soil moisture content would improve in 176 Ha. The construction of area treatment structures including farm ponds increases the water harvesting potential by 1,702,800 cum.

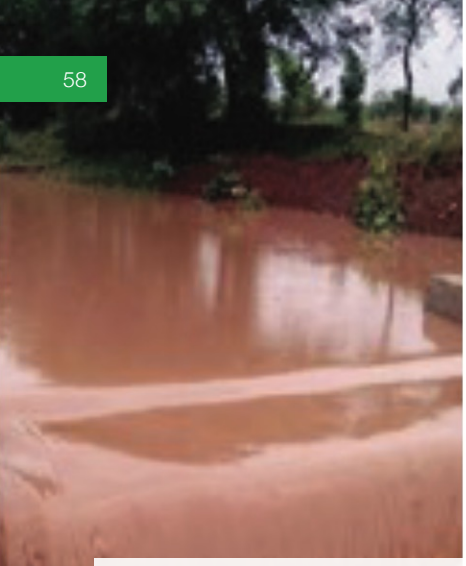
39

Around 88 per cent of the people in Bastar district depend on farms for their livelihoods, while the district has only 2.8 percent of irrigation area and 2.9 percent net sown area. Due to low productivity, the dependence of farmers on forests for their livelihoods has increased. However, the streams in the region are not perineal and due to the excessive soil erosion in the upper catchment, the rainwater does not percolate into the ground. Moreover, with a high steep slope, the sandy soil does not hold water and drains into the river. As a result, the water table in the plain area dries up just after monsoon.

One such stream called Baharjodinala, passes through Darbha forest range of Darbha block in Bastar. Seeing the demand of revival of Baharjodinala stream by the villagers, the ICRG team prepared an intervention plan to treat the land using the ridge-to-valley concept and increase the flow of water by a few months. The other objective was to increase the groundwater table with increase in the crop productivity by assured irrigation facilities.

Based on the plan, a successful intervention was done in Baharjodinala which had a catchment area of 5008 ha. After a ground truthing exercise and verification of site suitability of different structures, data collection for estimation were done for design and estimates. Thereafter the Detailed Project Reports (DPR) were prepared for its execution of 48 Natural Resource Management (NRM) structures including LBCD (Loose Boulder Check Dam), Staggered Contour Trench(SCT), 30-40 model, check dam, percolation tank and gabion) under Mahatma Gandhi NREGA in the area.

The immediate impact observed in the last one year was that 103 ha of land area successfully covered under erosion control measures. Water harvesting potential has increased by 59400 cum. Plantation area increased by 48.5 ha where 19400 plant species were planted. The interventions also generated 36363 person days and around 260 people were provided employment from the forest villages.



Khapri Gram Panchayat of Takhatpur block in Bilaspur district was facing severe water scarcity issues in the absence of any watershed structures, and despite having a big catchment area, the rain water was draining into the local stream named Bardohi. Similarly, in the absence of forest area, high surface runoff was leading to severe sheet erosion in the crop land areas as well as on the scrubs and wasteland. In addition, lack of awareness on Natural Resource Management (NRM) activities became a major problem in developing NRM planning for Mahatma Gandhi NREGA works at the Gram Panchayat level. Given all this, the ICRG team started with sensitization of villagers of Khapri Gram Panchayat. With the understanding of the importance of climate resilient structures, Gram Panchayat selected five Climate Resilient Works (CRWs) comprising 12 works to be constructed under Mahatma Gandhi NREGA.

Primary objectives of the interventions was to convert the wasteland into cultivable land by plantation of trees, channelisation of rain water through water harvesting structures, to provide sustainable income through diversified livelihoods practices. A series of check dams were constructed and integrated with the construction of earthen gully plug to check the siltation. The construction of these CRWs helped in reduction of soil erosion, checked siltation, soil moisture and health, and improved water storage capacity within the 500-meter length of stream.

A 5 ha wasteland between two check dams on the Bardohi nala was developed for plantation with staggered contour trenches. 30-40 models at the plantation site were constructed to capture the runoff water and check erosion of topsoil. The team also facilitated training of 32 farmers on improved agriculture practices like System of Rice Intensification (SRI) method of paddy cultivation and vegetable farming. Around 15 ha of land received life saving irrigation facility in the Kharif season. Similarly, it recharged groundwater. The intervention has also provided drinking water for 150 cattle, whereas earlier they had to travel long distances for water after the month of December.

"The ICRG team through convergence with the Krishi Vigyan Kendra (KVK) and Rural Agriculture Extension Officer of the agriculture department distributed hybrid paddy seeds (5 kg) and chicken peas seed (500 gm) to us."
Beneficiary household of the Climate Resilient Works

41

Dhur Gram panchayat in the Odagi block of Surajpur district has 267 households with a population of 1100. As the Odagi block shares its boundary with Madhya Pradesh and Uttar Pradesh, most of the poorer households resort to migration to these states to earn their livelihoods. The Covid 19 crisis and the returnee migrants created a huge unemployment situation in the Gram Panchayat.

The district and block administration cautiously opened four Natural Resource Management related Mahatma Gandhi NREGA Individual works in the FY 2020-2021 in the Gram Panchayat for the engagement of labourers by maintaining social distance as a precautionary health and safety measures. These works not only provided employment opportunities to the poor households but also provided better irrigation facilities to these vulnerable HHs to take double crop in a year. ICRG team supported the block and district administration in the surveillance of migrant workers returning from the bordering states of UP and MP. ICRG team prepared a strategy plan at for the GP level to improve the overall conditions of the vulnerable households.

One such Individual work of dug well having estimated cost INR 4.5 lakhs was sanctioned in the name of Son Say during FY 2020-21 to irrigate his paddy field during dry spell in the monsoon and also for second crop in Rabi season. 21 labours were engaged and have taken 45 days to complete the work.

The team also facilitated awareness on saftery and social distancing measures at Mahatma Gandhi NREGA work site areas. Scoping for alternative livelihood options for migrant workers was developed who don't have job cards.

42

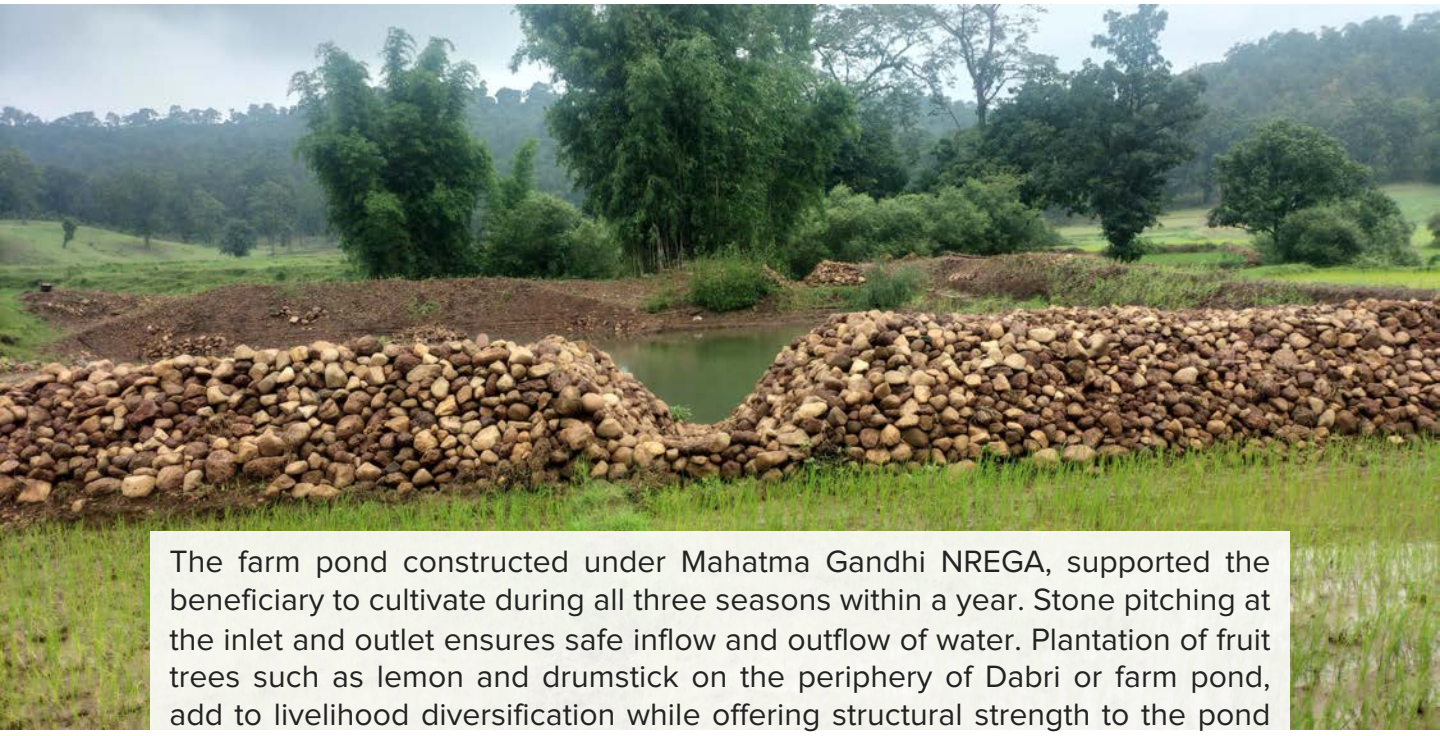
Tahkapal Gram Panchayat is located in Tokapal Block of Bastar District and has a total population of 2187 with 510 HH. Like any other panchayat, Tahkapal was also affected due to COVID-19 crisis situation in the country, and saw a huge returnee migrant worker influx from the bordering state of Telengana, thereby creating an extra burden on the limited resources of the Panchayat.

ICRG team was supporting the district and block administration not only on surveillance of such returnee migrant labourers but also in increasing the employment opportunities through Mahatma Gandhi NREGA in the Panchayat.

After observing the demand of work, two specific works on community pond and CCT (Continuous Contour Trench) and one individual work of Farm Pond were immediately taken up under Mahatma Gandhi NREGA. These three works generated 1798 person days. Apart from providing employment, these NRM works also helped in increasing the soil moisture content of the land, water conservation and support for additional crop in future. However, to execute the Mahatma Gandhi NREGA works several challenges were mitigated by maintaining social distance and precautionary measures for personal hygiene to fight with the Covid 19 crisis. Behavioural change trainings related to Covid 19 were also organised time to time for the villagers.

43

Jama Gram Panchayat is in Surguja district of Chhattisgarh. Agriculture is the primary occupation in the villages of Jama Gram Panchayat, which is primarily rainfed due to lack of enough irrigation facilities. The villagers demanded for more water harvesting structures, so that better irrigation facilities can be availed to improve the livelihood situation. ICRG team supported Gram Panchayat three climate resilient works (CRWs) comprising eight Mahatma Gandhi NREGA works were taken up to uplift the economic condition of the tribal people.



The farm pond constructed under Mahatma Gandhi NREGA, supported the beneficiary to cultivate during all three seasons within a year. Stone pitching at the inlet and outlet ensures safe inflow and outflow of water. Plantation of fruit trees such as lemon and drumstick on the periphery of Dabri or farm pond, add to livelihood diversification while offering structural strength to the pond itself. Grass pitching on the bunds acts as fodder and prevents soil erosion and silting of the pond. The asset created is benefitting the benefit farmer, whose land was used and also yielding benefit to three adjacent households.

ICRG team also initiated a consultative process to facilitate livelihood diversification, focusing on drought preparedness, resulting in preparation of a livelihood targeted convergence plan. Beneficiary farmers of the Climate Resilient Works were provided training on SRI method of paddy cultivation and different methods of mulching for vegetable cultivation, livestock management in rainy season, etc with the help of experts from Krishi Vigyan Kendra.

"We were also helped to access the government schemes of free distribution of five kg packet of paddy seeds, agriculture mini kit from the agriculture department and fish fingerlings from the fishery department."
Beneficiaries, Jama Gram Panchayat


JHARKHAND

44

Mahuadanr block of Latehar in Jharkhand is predominantly tribal block with 80% of the households belonging to this group. ICRG team initiated the process of sensitise the community, and conducted participatory exercises like time line analysis to understand the impact of climate change. Land restoration measures were discussed through pictures sharing, local traditional leader and PRI members were sensitised to take on such schemes which helps to combat climate mitigation.

Under Mahatma Gandhi NREGA, tree saplings are planted on the fallow/degraded or waste lands along with provision for its caring for three years. 100 acres of mango plantation was done in the area with the technical knowhow on intercropping methods. Mahatma Gandhi NREGA not only provided the wages to the community but also helped in conserving rainwater for crop production thus strengthening village livelihood.

After the sanction, the beneficiaries were provided technical handholding support in digging up the pits to conserve the rainwater. Trench cum bund (TCB), 30x 40 models and wells were constructed and drip irrigation was introduced in few of the plots.

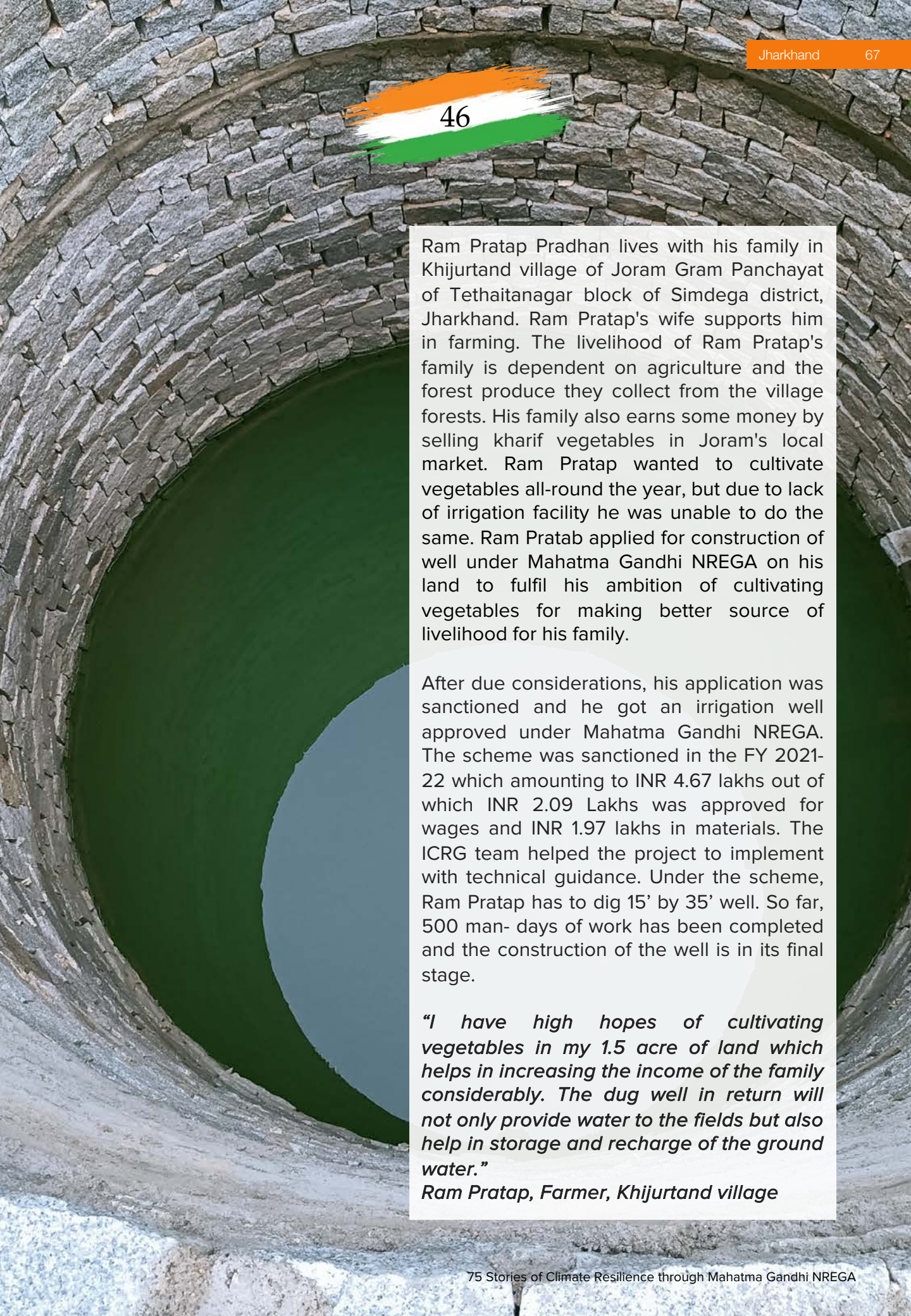
Many of the farmers have now started growing vegetables like sweet potato, tomato, ground nuts, etc. in these plots thus bringing in additional income to their households. The plantations on the other hand after few years will act as natural barriers to running waters, hold the soil and help in replenishing the local climatic conditions.

Kande Topno, lives in village Semartoli of Dahu Gram Panchayat of Rania block of Khunti district in the state of Jharkhand. The area is undulating, surrounded by hillocks and forests. Kande lives with his family of five, out of which two of them are working as a labour in other states. Kande's livelihood is mainly dependent on agriculture on his 3 acres of land. The family also collects minor forest produce from the nearby forests. Although agriculture being primary occupation of the family, they are able to cultivate only Kharif crops due to lack of irrigation facility. The region receives heavy rainfall during the monsoons but due to the undulating topography, high run-off towards downstream leaves the fields dry after monsoon months. Moreover, the uplands are not fit for cultivation and barring some millets and lentils no other crops are grown. During one of the village meetings on Mahatma Gandhi NREGA works and the various schemes associated with it, Kande showed interest in it. The ICRG team facilitated Kande in applying for development of his fallow land into fruit orchard under Mahatma Gandhi NREGS in convergence with other State schemes.

Kande's application was approved in the Gram Sabha and subsequently at all other levels. On his fallow land, 48 tree saplings had to be planted and taken care of. INR 1.6 lakhs was sanctioned for this activity. Accordingly, Kande dug 48 pits of 3'*3'*3' under Mahatma Gandhi NREGA with the help of two village labourers. The scheme also included setting up of a vermicompost unit.

"I have now started working in my fields, made pits to plant saplings. Along with plantation I have also set up the vermi compost bed nearby which help me to get organic manure and treat my fields. With the nearby well I can take care of my saplings. I plan to make TCB (trench cum bund) structures on my plot and take other measures to make this land productive. I have high hopes of increasing my income in near future by growing some vegetables on it".
Kande Topno, Community Member, Dahu Gram Panchayat

46



Ram Pratap Pradhan lives with his family in Khijurtand village of Joram Gram Panchayat of Tethaitanagar block of Simdega district, Jharkhand. Ram Pratap's wife supports him in farming. The livelihood of Ram Pratap's family is dependent on agriculture and the forest produce they collect from the village forests. His family also earns some money by selling kharif vegetables in Joram's local market. Ram Pratap wanted to cultivate vegetables all-round the year, but due to lack of irrigation facility he was unable to do the same. Ram Pratab applied for construction of well under Mahatma Gandhi NREGA on his land to fulfil his ambition of cultivating vegetables for making better source of livelihood for his family.

After due considerations, his application was sanctioned and he got an irrigation well approved under Mahatma Gandhi NREGA. The scheme was sanctioned in the FY 2021-22 which amounting to INR 4.67 lakhs out of which INR 2.09 Lakhs was approved for wages and INR 1.97 lakhs in materials. The ICRG team helped the project to implement with technical guidance. Under the scheme, Ram Pratap has to dig 15' by 35' well. So far, 500 man- days of work has been completed and the construction of the well is in its final stage.

"I have high hopes of cultivating vegetables in my 1.5 acre of land which helps in increasing the income of the family considerably. The dug well in return will not only provide water to the fields but also help in storage and recharge of the ground water."
Ram Pratap, Farmer, Khijurtand village

47

Susani Surin from tribal community of Siringbera village of Bambalkera gram panchayat of Thethaitangar block, Simdega, Jharkhand is engaged in agriculture and cultivates vegetables. She has 3 acres of land out of which 1 acre of land in the upland remained fallow. During one of the village meetings on Mahatma Gandhi NREGA and various schemes associated with it, Susani showed interest in development of her fallow land. ICRG team facilitated Susani in applying for development of 1acre of her fallow land into fruit orchard under Mahatma Gandhi NREGA in convergence with other schemes. The project was sanctioned with an amount of INR 3.77 lakh.

A total of 112 saplings have been planted in the plot. There are 80 mangoes in it and the rest are timber saplings. Susani is also cultivating vegetables in some of her land simultaneously. Seeing Susani's mango orchard, 12 other people of the village have applied under the scheme.

"I am thankful for the support which helped me to plant mango saplings in my field as well as cultivation of vegetables till the fruit saplings are small. This way I see a future where my asset becomes productive and will help me to increase my household income."
Susani Surin, Siringbera village

48

Udit Dungdung, 45-year-old, belonging to the schedule tribe community Baghchatta Gram Panchayat in Simdega district, has 4 members in his family. He is a farmer with 5 acres of land but due to water scarcity, he is completely depended on rainwater to irrigate his land.

ICRG team with the help of community leaders organized several meetings and motivated community members to work under Mahatma Gandhi NREGS for their land, water and livelihood. Continuous effort of the team changed the mindset of the villagers about Mahatma Gandhi NREGA works. During one of the awareness meetings in the village facilitated by ICRG team, Udit was motivated to apply for an irrigation well for his farm field. The project team facilitated Udit in filling up the application form. His demand was eventually approved in the Gram Sabha meetings.

Udit's application was sanctioned and an amount of INR 4.67 lakh which included the labour cost for 929 days. With the construction of the well, Udit irrigates 2 acres of his land. He plans to grow vegetables in his field and sell them in the local market, thus adding a source of income to his subsistence livelihood.

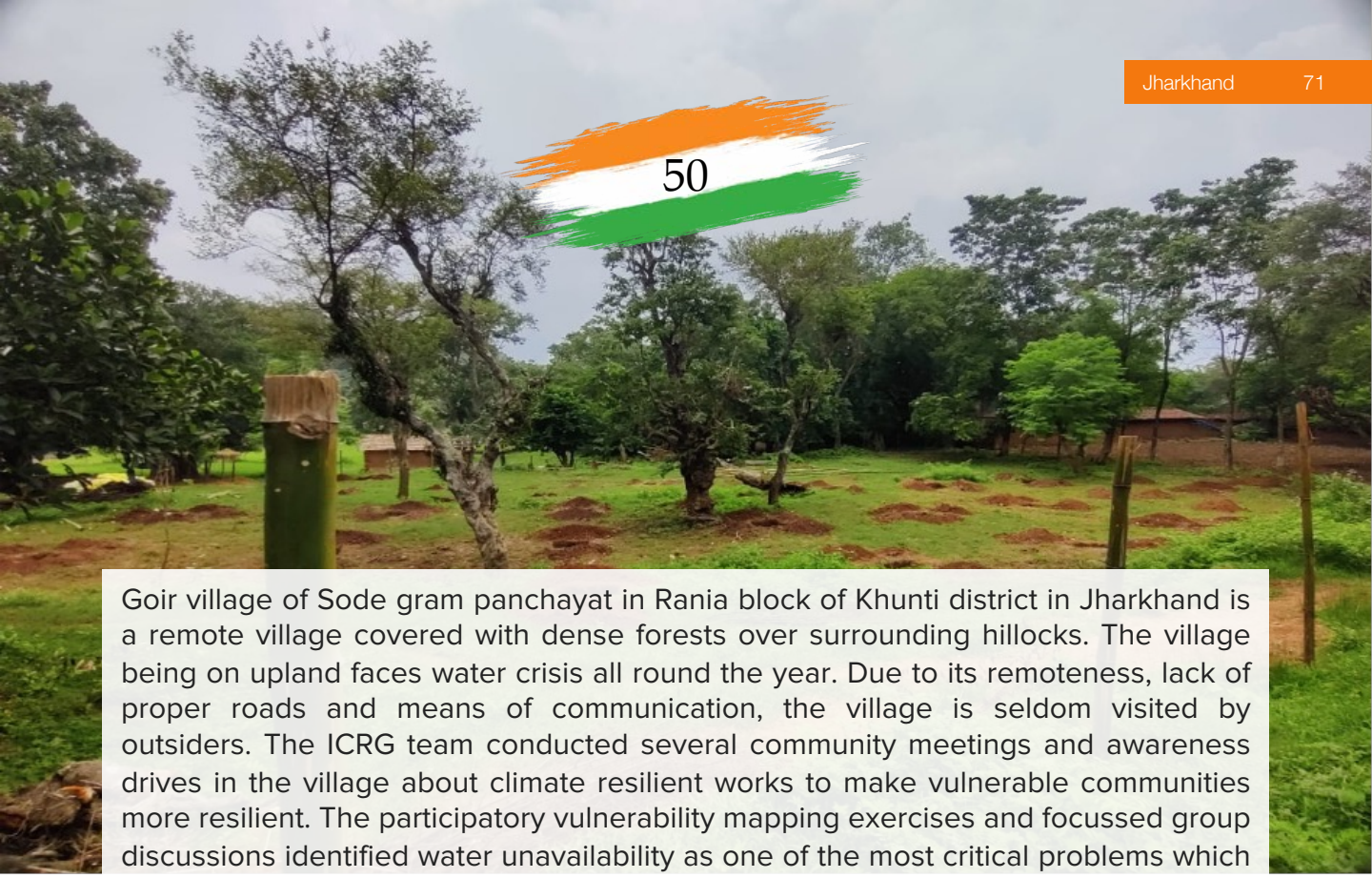
"The well also helps me and other farmers in getting water for drinking. Cattles now also be able to drink water from the source who otherwise had to travel to distant places."
Udit Dungdung, Farmer, Baghchatta Gram Panchayat

49

Like most of the villages of Jharkhand, Ladda Khambhan of Bagh-Chatta panchayat of Simdega district too depends on monsoons for agriculture. The impact of climate change can be seen in the villages with water table going down, lands getting degraded and the traditional systems of water conservation dying out, which has also impacted the livelihoods of the community. The ICRG team conducted series of meetings with community, PRI members and traditional leaders and local CBOs to sensitize them on climate change adaptation efforts in their local development planning process.

The process helped the community in identifying individual climate resilient works which can be taken up under Mahatma Gandhi NREGA. Technical support including demystification of GIS maps was provided to the community during this process that enhanced their confidence.

"Our village was facing critical water crisis which was impacting our crops and farmers faced problem in managing their crop cycle. Water level of existing water bodies has gone down and during summers the ponds and wells were also drying out. Sporadic yet heavy rainfall also caused soil erosion in the farm fields and forest. In community meetings we were made aware about climate change and its impact. Then some sites were identified where sufficient water could be stored with some technical help. We were motivated to demand for a well to be dug on my land. Due to sufficiency of water table in my land, it not only helped me irrigate my land but also helped other adjacent tribal families to overcome from the drought like crisis. We were also able to additionally generate more work under Mahatma Gandhi NREGS."
Lotem Kido, Khadia community



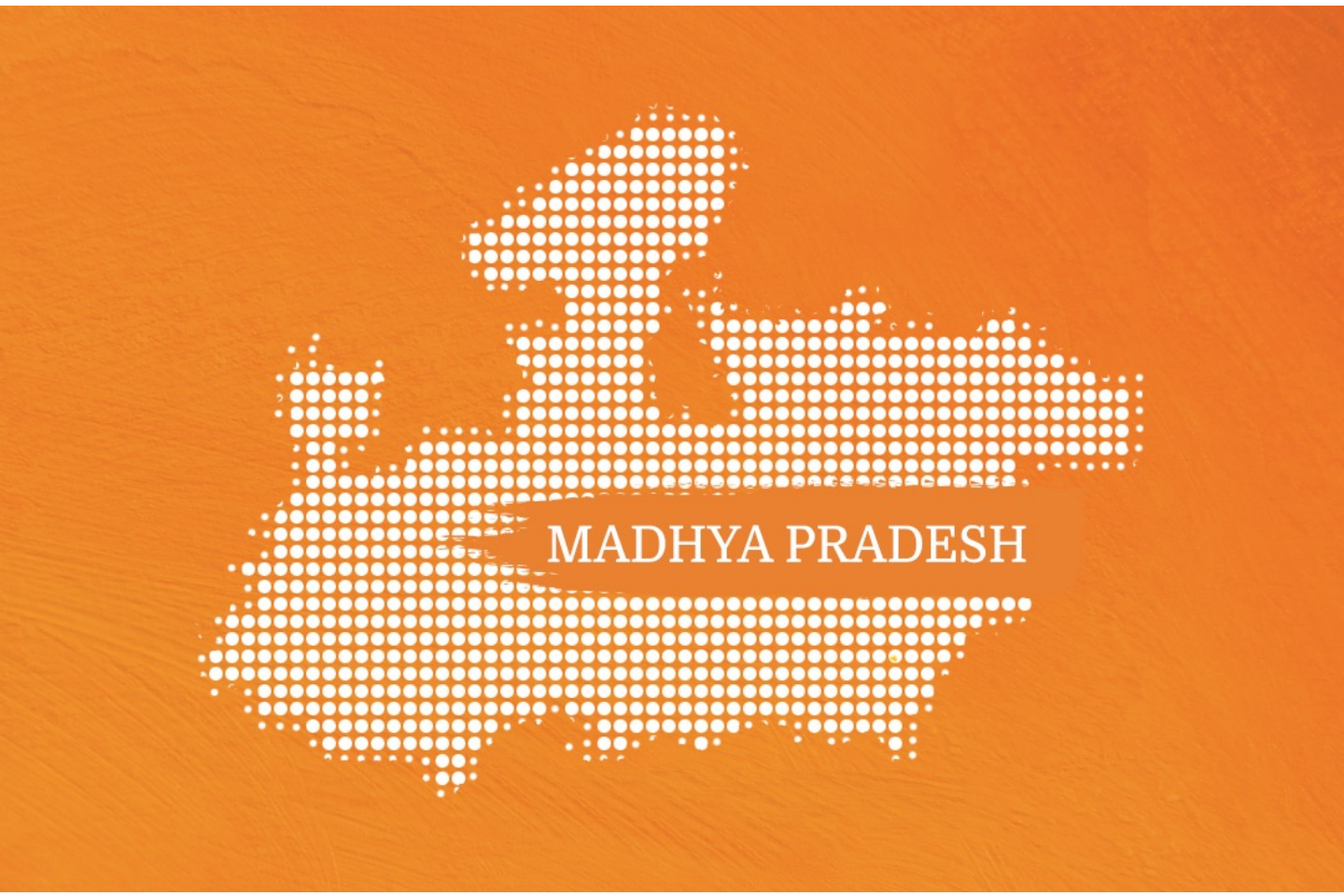
50

Goir village of Sode gram panchayat in Rania block of Khunti district in Jharkhand is a remote village covered with dense forests over surrounding hillocks. The village being on upland faces water crisis all round the year. Due to its remoteness, lack of proper roads and means of communication, the village is seldom visited by outsiders. The ICRG team conducted several community meetings and awareness drives in the village about climate resilient works to make vulnerable communities more resilient. The participatory vulnerability mapping exercises and focussed group discussions identified water unavailability as one of the most critical problems which impacted all the villagers equally. It was also identified that heavy rainfall erodes their soil thus making their lands more infertile.

To address these issues ICRG team identified few community sites to start a plantation drive in the village that will not only stop the soil erosion and prevent structural damages but also provide livelihood and additional income to the vulnerable families. The community felt that if plantation works are taken in the fallow and degraded lands it will help in checking the soil erosion and will also check the flow of water. The community also felt the need for more open wells. Plans were made with the project team's facilitation and put before Gram Sabha for approval.

As a result of this planning process, mango plantation in 6.5 acres of land amounting to INR 21.20 lakhs, two wells of 12' by 35' amounting to INR 6.48 lakhs and a pond of 80' by 80' amounting to INR 3.50 lakhs were proposed and sanctioned for the village under Mahatma Gandhi NREGA.

"These works will provide direct benefits to us through Mahatma Gandhi NREGS labour works. Water storage structures will also help us in meeting our water needs. Plantation works not only increases the green cover of the village but also help in soil treatment and checking the run-off water. In future, these saplings will grow into trees which will provide us with an additional source of income for the families. Now, we have started seeing Mahatma Gandhi NREGA as an opportunity to create the assets which aid in their livelihoods and also in restoration of their village habitat which the village elders often talk about."
Farmers, Goir village


MADHYA PRADESH

The Climate Resilience Information System and Planning Tool for Mahatma Gandhi NREGS (CRISP-M)

What is CRISP-M ?

The Climate Resilience Information System and Planning Tool for Mahatma Gandhi NREGS (CRISP-M) is a web-and mobile phone-based GIS aided tool to support planning, implementation and monitoring of Mahatma Gandhi NREGS. This tool has been co-developed by International Institute for Environment and Development (IIED) with Madhya Pradesh Council of Science & Technology (MPCST), National Remote Sensing Centre (NRSC), Indian Meteorological Department (IMD), Indian Institute of Tropical Meteorology (IITM) and Ministry of Rural Development (MoRD), Government of India, under the Foreign Commonwealth and Development Office (FCDO)-funded Infrastructure for Climate Resilient Growth (ICRG) programme.
The CRISP-M tool was developed with FCDO support under the Infrastructure for Climate Resilient Growth programme. CRISP-M, which can be accessed via computer or smartphone, was launched in October 2021.

How can it help Mahatma Gandhi NREGS overcome existing barriers?

The CRISP-M tool provides:

1. A drought monitoring and reporting system, to support early action on the provision of additional waged employment. CRISP-M's drought reporting mechanism provides early warning to Mahatma Gandhi NREGS functionaries and communities about the initial stages in the onset of droughts. The tool has established thresholds at which it indicates decision makers should trigger a drought declaration and initiate anticipatory response and planning measures for the additional 50 days of waged employment.

2. Climate risk-informed planning of Mahatma Gandhi NREGS integrated natural resource management assets, to strengthen climate resilience. CRISP-M integrates GIS layers of information (such as land use, topography, contours, geomorphology, geology, lineaments, groundwater prospect, drainage polygons and so on) with past and future climate data, enabling the 'future fit' planning of structures that can cope with climate impacts, such as reduced groundwater, increased runoff and so on. The tool also supports communities to carry out participatory vulnerability assessments, then check the information provided through the GIS tool against lived experience, so the plan can be modified or updated based on local/traditional knowledge, needs and local field conditions. Communities can also identify and prioritise assets that can help to strengthen their existing livelihoods, as well as reduce exposure to climate risks by diversifying their income base through agroforestry, horticulture, sericulture, fisheries, fodder development, and livestock-based farming systems.

3. Transparency and accountability by remote sensing-based monitoring, and crowdsourcing data on Mahatma Gandhi NREGS assets and beneficiaries. To introduce two-way accountability, and move beyond conventional top-down approaches to monitoring and impact assessment (often orientated solely to the needs of policymakers), CRISP-M helps to build an information system crowdsourced from the community. This enables farmers to verify claims on progress, report the status of their natural resource management assets, highlight structures needing repair or maintenance, and ensure more equitable benefit sharing. The tool also includes a remote sensing-based monitoring dashboard feature that provides time series-based impacts by Mahatma Gandhi NREGS assets, based on different biophysical indicators (such as changes in cropped area, wastelands, forest area, area of bodies of water and so on).

The case for a 'technology plus people' approach

Technology can bring together a range of information to enable a more scientific assessment of the risks and suggest options, but unless it is blended with local and context-specific knowledge and information it will not address the climate risks of the most vulnerable people. As with any technical solution, the CRISP-M tool alone cannot address the problem or be the primary decision maker on behalf of any community. Instead, it must be integrated with a people-focused process that enables the community to use technology as an input to aid their decision making.

Therefore, when developing a strategy to deliver the CRISP-M tool, we focused on developing a people-centred approach. Further, while CRISP-M supports the more scientific and risk-informed planning of soil and water conservation and engineering interventions, we also wanted it to provide opportunities for marginalised sections of rural communities to have a greater say, not just in planning and implementation, but also in monitoring and ensuring equitable access to the assets, resources and benefits created by the programme. To meet all these goals, our delivery model for CRISP-M focuses on:

- Ensuring rural people have complete ownership over the process, using the tool as an input to support and aid decisions related to planning, implementation, monitoring, management and maintenance
- Bringing diverse groups together, encouraging marginalised groups to voice their aspirations and needs, and converting community demand into community action, and
- Harnessing all the available techno-scientific resources alongside all the available Indigenous/local knowledge to support the decision-making process at village level.

The delivery model used for CRISP-M is a bottom-up participatory strategy, facilitated through use of a mobile application part of the CRISP-M tool. Key elements of the model are:

- Establishing coordinating structures to act as mentors for the Climate *Saathis* ('friend' in Hindi), with the help of grassroots nongovernmental organisations at block and district level. The mentors offer support around awareness generation, capacity building, planning, implementation, monitoring and community action processes, as well as helping to solve technical issues that arise when the tool is used at village level.
- Creating a cadre of Climate Saathis, chosen from among the community and trained in using the tool. They are supported by block-level mentors to mobilise and conduct participatory planning at the village level. The Saathi role includes:
    - Creating awareness within the community: mobilising people and helping them understand how to use the tool for individual and community-specific needs around the planning, implementation and monitoring of Mahatma Gandhi NREGS. Where required, organising awareness and training programmes for community members on how to use the tool for planning, implementation and monitoring.

- Working with individuals and smaller groups of marginalised communities within the village to help them become familiar them with the tool. This helps make marginalised people aware of both how Mahatma Gandhi NREGS can support them, and how information from the tool could help them voice their needs and priorities in the *Gram Sabha* meetings.
- Working on building the capacity of people's representatives, members of village Panchayats and Rozgar Sahayaks/Mates (Mahatma Gandhi NREGS appointed functionaries at village level, who assist the *Gram Panchayat* in executing Mahatma Gandhi NREGS works) on how to use the tool to support planning, implementation and monitoring.
- Supporting the community to contribute to a social audit via the mobile app, helping to create transparency for the equitable sharing of gains and benefits.

In many respects, the Climate Saathis act as local climate warriors: they are the key to successful and effective delivery of the CRISP-M tool among communities.

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51

Rukmani Bai, 55, lives in the remote village of Barela in Madhya Pradesh. Since her husband fell ill and could no longer work, Rukmani has shouldered the responsibility of feeding and sustaining the family. Rukmani started cultivating her husband's farmland, growing wheat, maize and gram (chickpea). Climate change impacts are damaging Rukmani's crops. Yet Rukmani was unable to claim government benefits available to small and marginal farmers because she did not own the land.

The ICRG project's Climate Saathi - a volunteer who is tasked with creating community awareness of how to use the CRISP-M tool and gain access to the benefits provided by Mahatma Gandhi NREGS, met Rukmani and made her aware of her rights under the scheme. She helped her to understand the provisions of the programme — how to get her job card registered, raise the demand for work, and participate in the planning of the scheme. The Climate Saathi also helped Rukmani understand how to use CRISP-M, helping her to decide what type of water conservation structures were needed to support long-term climate resilience in her village. Easy access to information though CRISP-M has improved the involvement of Rukmani and other women in the village to demand for inclusive development.

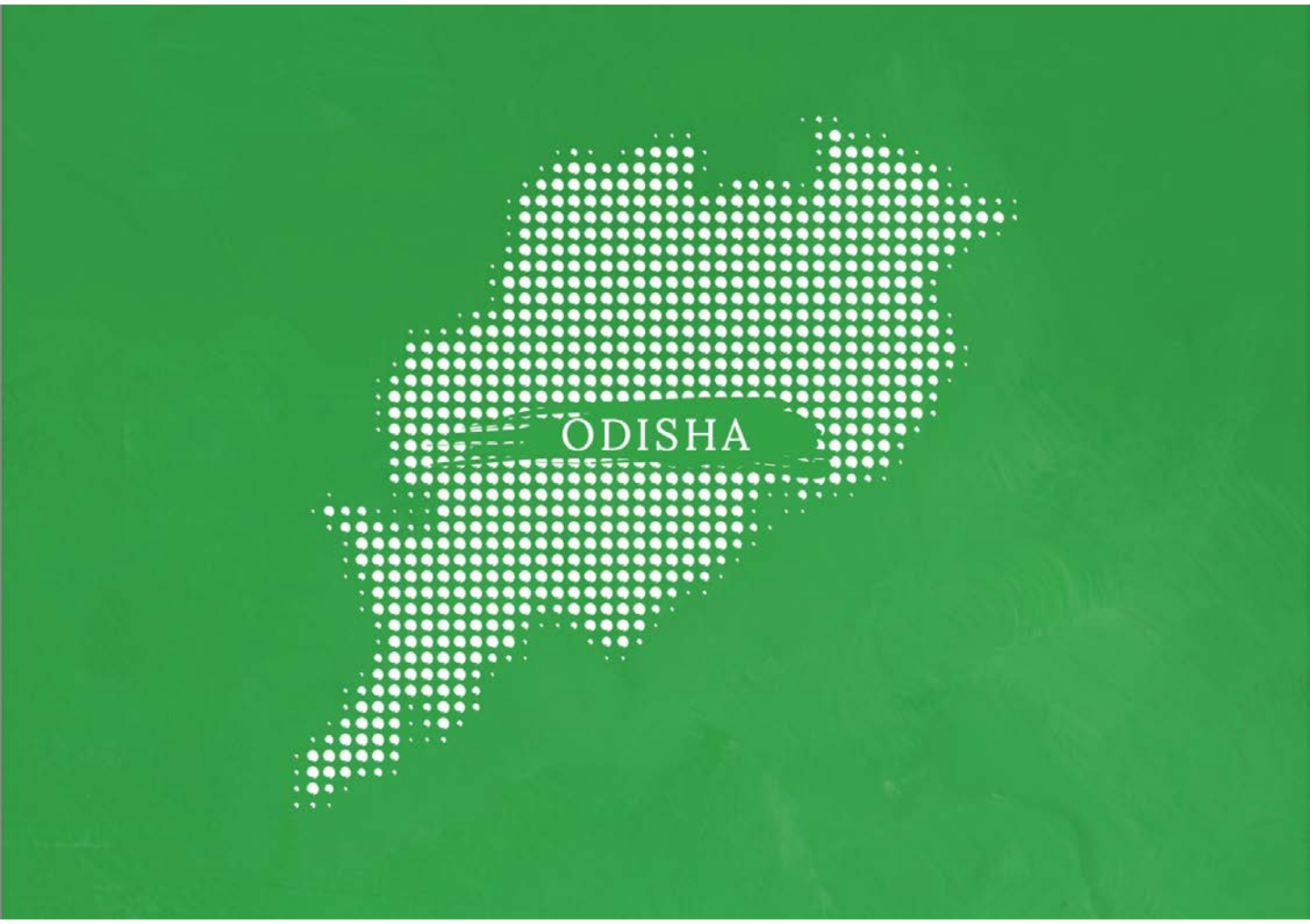
Now, Rukmani had already started voicing her opinions with the Gram Sabhas, her familiarity with CRISP-M gave her access to vital information, improving her interactions with the administration and village representatives. *Rukmani said:* ***"When I go to village meetings, people look at me with respect and awe because I have information that they don't have. But I don't just use information to help myself. I share it, so that others can benefit from it."***

Rukmani already led a village self-help group of 25 women — aimed at improving their livelihoods through collective savings, income generation, natural resources management, literacy, childcare, nutrition, and so on.

Madhya Pradesh is one of the driest states in India, with an average annual rainfall of just 700mm — declining 23% over the last 20 years. The region struggles with a low water table, and the situation is getting worse, with rivers running dry at an alarming rate. This is having a severe impact on the lives of those living in Bisanjpur Tandi village, Narsullaganj Block. Four years ago, the Gram Panchayat (decentralised elected village body) treated a big patch of land with continuous contour trenches (CCT) to help increase the groundwater level in Bisanjpur Tandi. This encouraged a Climate Saathi — a grassroots volunteer working to raise awareness of climate change issues — to hold meetings with community members to motivate them to do something similar using ICRG's CRISP-M. Their job was made easier because villagers could see from the earlier project how the proper treatment of land and water resources could help solve their water problems in the long run.

The residents in Bisanjpur Tandi were then inspired to use the information provided by CRISP-M to identify a piece of barren land that was not being used by the community. They are now proposing that a CCT structure be built on this ten-hectare site in the next year's village developmental plan. The trenches are designed to collect rainwater flowing downhill. The soil excavated from digging the trench is used to plant grass and legumes, helping to trap sediment that would otherwise overflow from the trench during heavy rainfall. The water then provides soil moisture for crops cultivated after rainfall, perhaps even extending to the dry season, and potentially making a big difference to farm crops in the village.

Sardar Singh Barela, a resident from the village, said: ***"Engineers had come to our village to plan out everything when the CCT was made earlier. With CRISP-M tool we are all technical experts now. We choose the land and where and what type of structure to build. We are no longer dependent on outsiders. This is better because we know what is best for us."***


ODISHA

Sushila Hans is a widow living in the Dabri village of Naupada district and owns one acre of land. She was in need of well for irrigation purpose. She applied for the same in Gram Panchayat office. With due process construction of well was approved under Mahatma Gandhi NREGA. ICRG team assisted her with technical help in the construction of a ring well on her land.

"Timely irrigation of crops has been a problem here since the last couple of years and this ring well allows me to water my land without any hindrances. Things are getting better."
Sushila Hans, Beneficiary

Similarly, the construction of a farm pond recharged the ground water and made arid land suitable for cultivation for Biharilal Manjhi, another farmer of village. Through the State Horticulture Department, he received resources for a mango plantation that he is now nursing on his land.

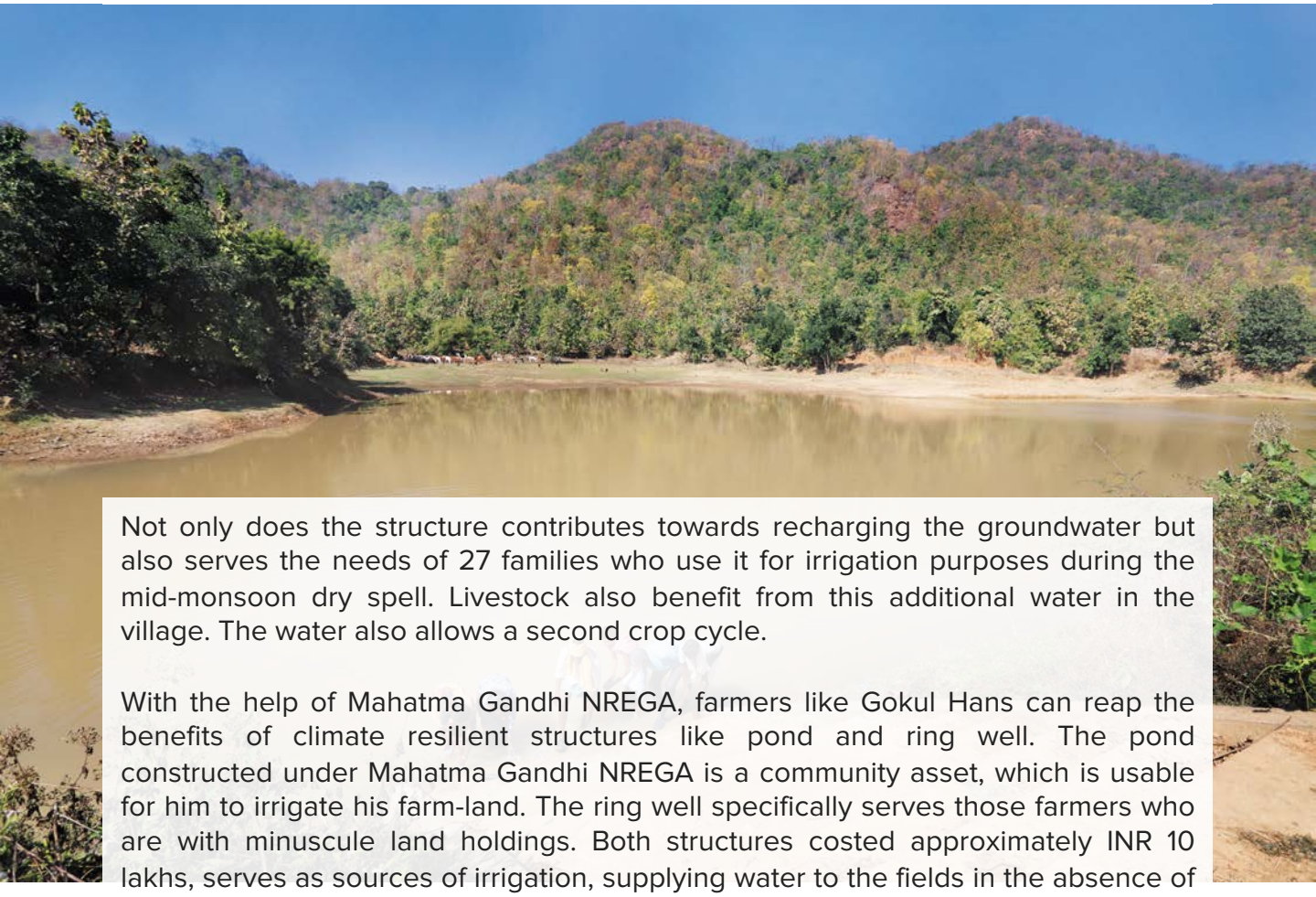
"I think I have benefited the most in the area – having converted barren land into farmland through convergence,"
Biharilal Majhi, Farmer, Dabri village

Another beneficiary of convergence is the paddy farmer Tula Ram. Owning a half an acre patch of land, Tula Ram for three years saw almost no cultivation due to drought – his total harvest was 75 kg. Upon invitation by the ICRG programme, Hyderabad-based International Crops Research Institute for the Semi-arid Tropics supplied Tula Ram with the seeds of a drought resilient variety of paddy. This year, his total harvest was an impressive 1,250 kg from the same fields that yielded only 75 kg three years ago.

"My seeds are able to sustain the crop even in a dry spell without the need for heavy irrigation that the typical paddy requires,"
Tula Ram, Farmer, Dabri village

54

Dabri village in the Khariar block is not too far from the district headquarters in Nuapada. The post- monsoon runoff caused siltation and soil erosion, with little impact on improving groundwater levels. During the Gram Sabha, the issue was raised by the villagers. To resolve this crisis, water harvesting structure was created under Mahatma Gandhi NREGA with technical guidance from ICRG team.



Not only does the structure contributes towards recharging the groundwater but also serves the needs of 27 families who use it for irrigation purposes during the mid-monsoon dry spell. Livestock also benefit from this additional water in the village. The water also allows a second crop cycle.

With the help of Mahatma Gandhi NREGA, farmers like Gokul Hans can reap the benefits of climate resilient structures like pond and ring well. The pond constructed under Mahatma Gandhi NREGA is a community asset, which is usable for him to irrigate his farm-land. The ring well specifically serves those farmers who are with minuscule land holdings. Both structures costed approximately INR 10 lakhs, serves as sources of irrigation, supplying water to the fields in the absence of monsoons.

The Mukhiya Narendra Kumar Herna is widely credited with being the driving force behind the construction of the structure in his village.

"Knowing that water is available when we need it, gives us the confidence to grow other crops, including vegetables. Until a few years ago, this was not possible. The structure ensures a consistent supply of water till the month of June, which helps the community here in many ways. As the edges of the structure are retrofitted with guard walls, it does not allow the silt to move forward, giving us water that is of better quality than before,"
Narendra Kumar Herna, Mukhiya, Dabri Village

55

Chormara village of Bijepur Gram Panchayat (GP) is one of the migrations-prone GPs under the Titilagarh block of Balangir district. Many households of Chormara migrate to the brick kilns of Hyderabad due to drought-like situations and long dry spells every alternate year. A major patch of the village was irrigated through Dungripali Mege Lift Irrigation Project. But over the period, the irrigation canal of the project got silted and the wastage of water resulted in moderate to high moisture stress in nearby agricultural land. This problem was raised by the villagers during the GIS Planning exercise conducted by the ICRG in collaboration with Block Administration, Titilagarh.

A block-level team was constituted for a detailed plan to rejuvenate the canal of Mega Lift irrigation. The team realized that rejuvenation of the irrigation canal will not solve the purpose unless the structure is supplemented with additional structures of staggered trenches for moisture conservation in the upper ridge, restoration of silted water bodies, land development and compost pits in farmer fields.

Accordingly, Climate-resilient integrated structures were planned to provide irrigation facilities to 10 acres of land by connecting the Mega Lift Irrigation Point with the Kharseldungri tank through a canal and field channel, with an estimated cost of INR 18 lakhs. The project was completed within a year and provided 77 days of work to each of 43 households.

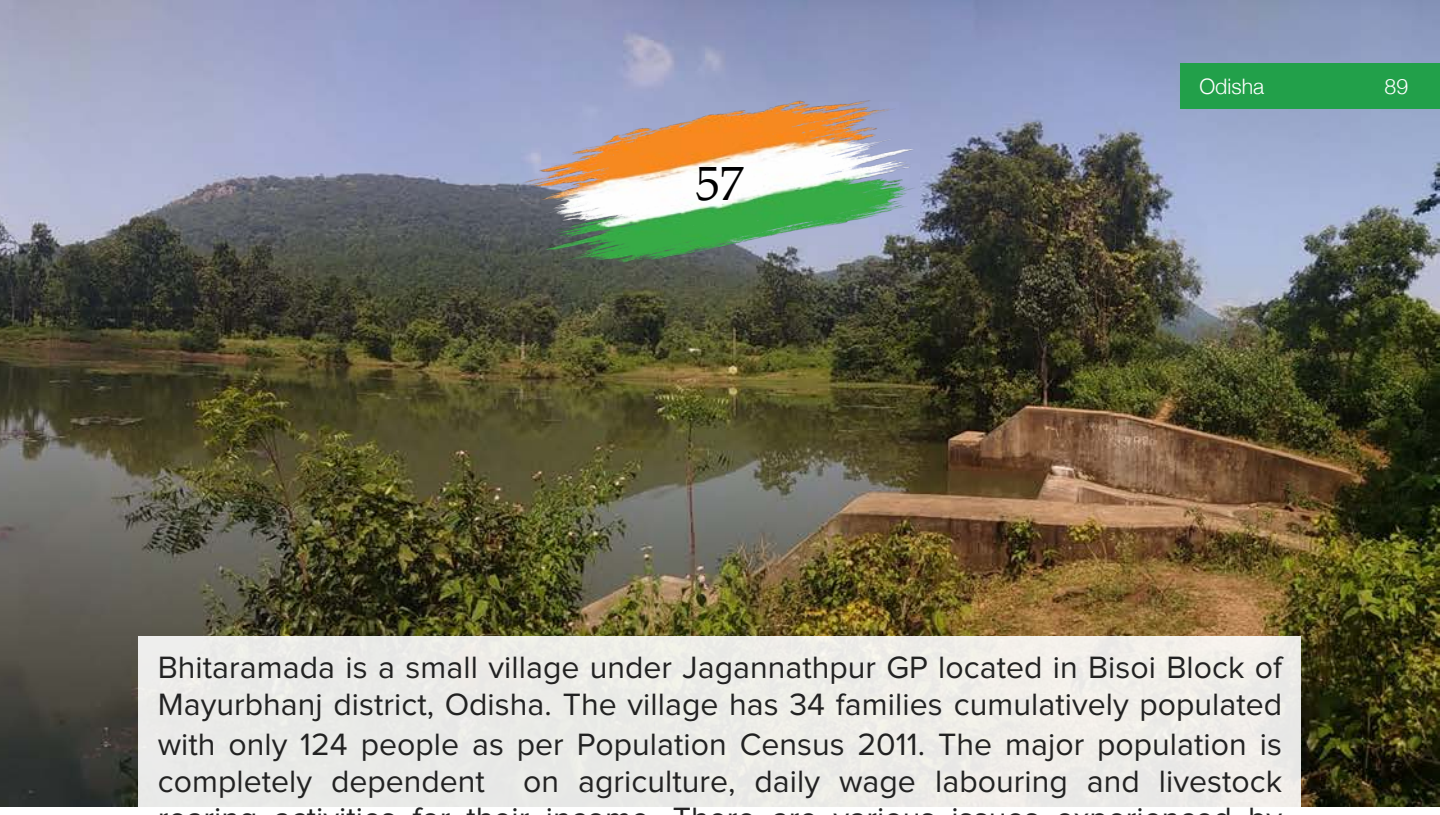
"The intervention demonstrated how integrated structures with appropriate planning can lead to resilient structures and also provide livelihood opportunities to needy households."
Farmers, Chormara village

56

Khanta is a small village situated in Khanta Gram Panchayat of Bijatala Block in Mayurbhanj district. The village Khanta is fully dominated by tribal community. About 90% of the households of the village belong to ST category and the block has been facing severe drought conditions since last 30 years. According to the baseline survey conducted by the ICRG team, this block was found to be highly vulnerable to climate change due to increased poverty and reduced agriculture activities over past few years.

The ICRG team had conducted series of village meetings to sensitize the community on climate change and developmental needs of the areas which were captured based on the biophysical and socio-economic parameters. As a result, the community started confidently demanding thneed based NRM assets for their village. The participatory planning exercise resulted in an effective work and labour budget under Mahatma Gandhi NREGS with a total INR 48 lakhs.

The renovation work of community tanks was taken up to recharge ground water and address climate change issues with the help of Mahatma Gandhi NREGA in convergence with other schemes. All these NRM works are enabling villagers to go for cultivation of two cycles of crops in a year.



57

Bhitaramada is a small village under Jagannathpur GP located in Bisoi Block of Mayurbhanj district, Odisha. The village has 34 families cumulatively populated with only 124 people as per Population Census 2011. The major population is completely dependent on agriculture, daily wage labouring and livestock rearing activities for their income. There are various issues experienced by these villagers but among them the main issue was the scarcity of water for cultivation, domestic use and drinking purposes. They are having cultivable lands but due to undulating topography the water storage is quite difficult for irrigation activities. The erratic rainfall in this area has further increased the problem of water availability and storage during the Rabi session. The marginal farmers of this small village are mostly growing vegetables and have been badly affected due to water shortage problem during Rabi crop.

Village community consulted ICRG team regarding the problem. ICRG team recommended water conservation strategies with plantation work as climate resilient demonstration work under Mahatma Gandhi NREGA for the village. The renovation of the pond along with implementation of allied activities has brought a remarkable change in the area by providing irrigation for vegetable cultivation.

Now people are able to cultivate vegetable in about 5 ha of land with support of seed and other inputs through convergence. After the cleaning of the pond, it has retained 18 feet of water and the ground water level has increased by up to 1 meter. The villagers are using the water from the pond for vegetable cultivation and domestic use.

"Around 10-12 farmers grew vegetables like brinjal, round guard, bitter guard, lady finger, etc. in 5 ha during Rabi season and earned about INR 15,000/- for each vegetable during this season. Also, the soil erosion has reduced and soil moisture has increased thus enhancing soil nutrition. The renovation of pond has created huge irrigation potential for Rabi crops and helped in addressing other livelihood issues of the community."
Farmers, Bhitaramada village

58

Birun Majhi, a farmer from Titisilet village of Titilagarh block under Balangir district becomes a shining example of dry-land farming at its best. Traditionally, he grows cotton in medium upland. Cotton is a high input and labor-intensive crop but fetches low net profit. He knew how to cultivate cotton but was unaware of how to maintain effective nutrition in the soil that could lead to increased productivity. He was afraid to make any changes to his land, the kind of seeds and fertilizers he used, and the methods of farming he followed in farming, due to the lack of financial support and appropriate guidance.

Birun Majhi shared his problem during a community meeting of the Gram Panchayat. ICRG team took a note of that issue and connected with the local administration. With support of the block administration and the horticulture department, cultivation of drought tolerant and high-yielding variety of drumstick was initiated with an estimated cost of INR 55000 under Mahatma Gandhi NREGA in convergence with other schemes in 0.20 ha. Out of this, INR 39,000 were allotted for wage components, and the remaining INR 16,000 was for material costs including sapling, fertilizer, plant protection measures, etc. ICRG also assisted the beneficiary in coordinating with the Horticulture department at the district level for installation of a micro irrigation system at a subsidized rate under PMKSY on his land. Majhi also received training on drumstick cultivation from the horticulture department.

"As of now, I have earned a profit of almost Rs 20,000 and expecting another good profit within a year by cultivating one acre of the drumstick. I have now become the lead cultivator of drumsticks in the Bangomunda block."
Birun Majhi, farmer

59

Titisilet of Balangir district is one of the tribal-dominated migration-prone villages. A major portion of its geographical area is undulated and remains fallow. The farmers of the village encountered a change in precipitation patterns and continuous dry spells in the area that leaves the land fallow due to poor soil moisture. Also, insufficient replenishment of soil nutrients in the long-term and absence of precipitation causing prolonged droughts threatens the water and food security in the area. These issues were raised by the villagers during community meeting of Gram Panchayat with the ICRG team.

The team, with support of the Block Administration, took proactive steps to construct climate resilient integrated NRM structures at Titisilet village using the ridge-to-valley treatment, integrating gully plugging, loose boulder check dam, staggered trenches, rainwater harvesting structure and plantation for complete treatment of the area under Mahatma Gandhi NREGS over a period of two years. The structures were planned and designed in an integrated approach by referring to the historical climate change data.

Approximately INR 30 lakhs were spent for creation of integrated climate resilient NRM structures to restore the degraded area which also provided employment to 75 households and generating 5521 person days of work. **The intervention transformed 8 ha of unproductive land to productive farmland.**

"Well planned structures designed in an integrated approach are making it suitable for millet, gram, onion, and cotton cultivation due to improved soil moisture conditions."
***Farmer,** Titisilet village*

60

Manglu Rana of Digsira Gram Panchayat in Titilagarh Block had left his 3-acre land uncultivated due to lack of irrigation facilities. He used to migrate to Andhra Pradesh in search of work. He put his problem of acute water scarcity in front of Gram Panchayat during a community meeting.

ICRG team with the support of the Titilagarh block administration assisted Manglu Rana to address this problem and a dug-well was constructed in his land under Mahatma Gandhi NREGA with an estimated cost of INR 64,000. Manglu received INR 12800 as wage under Mahatma Gandhi NREGA and utilized it for vegetable cultivation on one acre of land. With the construction of the dug wells, now he doesn't face water scarcity and since then, he continues cultivation on his own 3 Acre land. He is now engaged in agriculture for eight months a year and relies on Mahatma Gandhi NREGA work for the rest of the year.

Last year, he earned INR 50,000 by selling vegetables like tomatoes in the Kharif and watermelon in Rabi after which he stopped migrating to other places. Moreover, he maintains a nursery of vegetable seedlings to help his neighbours for whom agriculture remains a daunting task due to acute water scarcity.

"The typical day of migration was very difficult as we had to move from place to place looking for jobs. We were provided a place to stay, but it always came with a price, and the price was "Work". We were given a job and once we finish it, we were allowed to stay. Now I grow the seedlings here and distribute them to three of my neighbours. The well is now a source of survival not just for me, but for three families."
Manglu Rana, Beneficiary, Digsira Gram Panchayat

61

Bakti village of Agalpur block is now a prominent place in the livestock map of Balangir district. Balangir-Kalahandi-Nuapada Milk Union has developed the Milk Producer Cooperative Society (MPCS) at Bakti covering a few neighbouring villages. Over the years, the milk producers -mostly women – depended on the natural fodder available in the pastureland and the crop residues, mostly straw, left after harvesting the paddy fields, to feed the cattle. But over the years, they are experiencing a shortage in fodder availability due to the encroachment of grazing land. This has necessitated them to buy additional nutrition supplements for livestock feed, increasing the milk production costs by about 30-40 %.

The issue was addressed by converting pasture and unproductive fallow land into fodder farms to supply green fodder to the members of MPCS round-the-year. Five acres of fallow land was developed under Mahatma Gandhi NREGA with the support of Balangir-Kalahandi-Nuapada Milk Union (BKNMU), Odisha Livelihood Mission, Horticulture Department, and Veterinary Department. ICRG coordinated with district-level line departments and brought them under one platform and addressed the issues through convergence. A comprehensive convergence plan was developed at the district level followed by consultation with members of the Milk Producers' Cooperative Society (MPCS) to make this initiative practical with an estimated project cost of INR 15 lakhs comprising integrated structures of land development, water harvesting structures, SMC measures, fencing and fodder cultivation. Hybrid Napier, a perennial grass that can be retained in the field for 2-3 years was cultivated along with other seasonal fodder with assured irrigation sources through dug well and water harvesting structures constructed under Mahatma Gandhi NREGS. A drip irrigation facility was also created for effective utilization of water through a community partnership with the Horticulture department and BKNMU, Balangir.

Currently the MPCS is harvesting 150-200 tons of green fodder/hectare which resulted in an increase in milk production by 20% and reduced the cost of milk production, resulting in an additional income of INR 3000 from milk production. Besides, 4054 person days were generated by engaging 45 households.

"Through this intervention, Mahatma Gandhi NREGS has not only created a platform to increase the farmer's income but also created a durable asset that is being managed through community participation."
Farmer, Bakti village

62

Odisha Livelihood Mission (OLM) launched a special scheme named “Mo Upakari Bagicha (Nutri-Garden) to enhance nutritional security through dietary diversity of adolescent girls, women, and children. Access to quality saplings at an affordable rate was a challenge, before OLM established Mo Upakari Bagicha in the Turekela block of Balangir district.

OLM in collaboration with ICRG proposed the idea of developing nurseries at the community level to supply quality drumstick and papaya saplings to meet the mandatory requirement of the scheme and provide an alternative income generation avenue to the Women Self Help Group. OLM provisioned for a special loan for nursery generation inputs for SHGs where Green Net Shed was constructed under technical guidance of ICRG team to start the community nursery. Handholding and training support was provided by the district horticulture department as per the standard package of practices. Saplings were supplied to establish Mo Upakari Bagicha of 1200 women beneficiaries under Mahatma Gandhi NREGA with an estimated cost of INR 12000 per beneficiary.

Maa Nilamadhaba Self Help Group, Badabanki invested INR 42,000 to raise 6000 saplings, while they were able to sell saplings for INR 90,000 to the farmers of Mo Upakari Bagicha and got a profit of INR 48,000. Encouraged by this success, the women of SHG got motivated to continue with the nursery. In a short span of time, the SHG has converted its community nursery into early success. The lack of livelihood options in this area created a platform for members of SHG to invest time and resources into making their community nursery a viable, alternate source of livelihood.

“Earlier we had to purchase stale vegetables from the market, but “Mo Upkari Bagicha” intervention has helped us to avail green and nutritious vegetables throughout the year”.
Subidha Majhi, President of Maa Nilamadhaba SHG

Ghantiadar is one of the villages of Thakurmunda block in Mayurbhanj district, where most of the households belong to the tribal community. Major part of the community is under developed. They are mainly dependent upon agriculture; daily wage activities and collection of non-timber forest produces. Local farmers of this village were unable to cultivate due to irregular and unpredictable rainfall, reduction in ground water level and random deforestation.

Villagers realised that the main issue of the area was uncultivable land and less production due to lack of water availability. During community consultations, the ICRG team recommended the renovation of water harvesting structures along with construction of earthen embankments for cultivating vegetables in the area. While water harvesting structures like ponds and small bolder check dams were created under Mahatma Gandhi NREGS, vegetable gardens were promoted through convergence with Integrated Tribal Development Agency (ITDA), Karanjia.

A well-planned vegetable production is not only very lucrative to alleviate poverty but is also a potent food self-security approach. Seeds (Brinjal, bitter-gourd, tomato, and long beans, maize) were distributed to beneficiaries through ITDA. **A total of 33.11 acre of vegetable cultivation comprising brinjal cultivation in 8 Acre, bitter-gourd in 17 Acre, long beans in 1.11 Acre, maize cultivation in 7 Acre was done by farmers benefitting 81 households. Thus, convergence has led to increased productivity of farmers and income enhancement.**

"Vegetable production with good planning has led to livelihood enhancement and also has successfully created organic farming options for us at Ghantiadar village."
Farmer, Ghantiadar village

64

Patimal village, Khaprakhol block located in the Balangir district is one of the areas affected economically by the pandemic. Because of COVID19 pandemic, mobility was an issue, some of the women faced difficulty for marketing of their agriculture produce. In a society deeply entrenched in social and structural barriers that decide the role of a woman, women like Janaki Devi, 27-year-old, a manual labourer, and President of Maa Jagyanseni, a SHG along with other members of the group stepped up to initiate actions to support their own livelihood.

SHG group put their concern in the community meeting of Gram Panchayat which ICRG had organized and supported the SHG with various strategies to mitigate the economic impact of the pandemic through alternative livelihoods. This SHG was supported for setting up a community nursery under Mahatma Gandhi NREGA in convergence with the State Livelihood Mission. Training and orientation on quality saplings production and community nursery management was imparted for the SHG group by the ICRG team.

The intervention has helped the SHG to raise 5000 saplings of papaya and drumsticks each with the remarkable success of around 80 percent germination rate. The saplings raised were supplied to the beneficiaries of “Mo Upkari Bagaicha” established under Mahatma Gandhi NREGS with an estimated cost of INR 12000 per beneficiary. The community nurseries are well managed by the SHG with the supplementary initiative – that of green shed net provided by ICRG to mitigate the risk of crop failure.

“This endeavour of community nurseries was facilitated for 9 SHGs in the 14 project blocks of the 3 districts and established a total of 24 units of community nurseries – directly covering 4952 women beneficiaries covered under nutri-garden and indirectly reaching out to 19060 community members by way of sapling distribution for nutritional support.”
Janaki Devi, President of Maa Jagyanseni SHG

65

Samal Singh, a daily wage worker, lives in Bhundapal village of Samakhunta block, Mayurbhanj district with his four family members. The entire family depends on Samal Singh's infrequent earnings. His primary occupation is farming on their land, but face difficulty due to lack of irrigation facility and soil erosion due to excess water flow from the Similipal hill. The issue was brought into the knowledge of Gram Panchayat.

ICRG team facilitated the technical guidance during the construction of cement concrete canal under Mahatma Gandhi NREGA to increase the water table in nearby small water harvesting structures. Alongside, quality seed inputs from Integrated Tribal Development Agency (ITDA) and agriculture department and lift irrigation points were leveraged from Jalanidhi scheme on a convergence mode. Jalanidhi Scheme-II, launched by Government of Odisha entitles 90 percent subsidy for community lift irrigation point while the rest 10 percent to be borne by the beneficiaries. **The total cost incurred for the project was INR 10 lakhs, with which more than 25 acres of land of 35 farmers got benefitted.**

Samal Singh became one of the beneficiaries of Jalanidhi scheme by depositing INR 9000 as farmers' contribution to avail the benefits and subsidy. He also received various technical training under ICRG programme, including awareness on the impact of climate change, its mitigation strategies, seed treatment training and the need for an integrated farming model. The intervention assures irrigation in a total of 5 acres of land which includes 3 acres of Samal's land.

"Previously the produce was only consumed within the family, but the training programme helped me adopt mixed cropping of groundnut with maize, and over the years the production has increased substantially."
Samal Singh, Beneficiary, Samakhunta Block

Bahalda village is situated in the bottom of Similipal biosphere and 14 km away from Khunta block - head quarter of Mayurbhanj district. The 138 households in the village – majority belonging to Scheduled Tribe community – depend mainly on agriculture and allied activities. The rainfall pattern has become erratic due to changing climate and that is impacting the crop productivity. Also there are issues like soil erosion and siltation which is affecting the agricultural land. The irregular rainfall and lack of irrigation facility hampers the farmers' livelihood scenario in village leading to food insecurity amongst the community.

Considering this vulnerability scenario, exposure to long term climate change and the field assessment, ICRG team proposed construction of canal from Dalki Bandha to Tatu Murmu Bila area of this village. The core structure of canal was designed to provide irrigation facility to 50 ha of land in the command area accompanied with construction of dug wells for six families.

INR 5.00 lakh has been incurred for construction of canal and INR 9 lakhs were spent on the construction of dug wells under Mahatma Gandhi NREGS for 6 families. After construction of canal, 48 ha of land are being irrigated by free flow of water through canal to the land. **52 numbers of Scheduled Tribe households are directly benefitted through the project. These farmers have grown paddy and pulses during Kharif session in 48 ha of land. It is found that the productivity of the farmers in the command area is also increased by 25% during Kharif in comparison to last year with improved irrigation facilities. Now the canal is acting as a life line for the people of Bahalda village.**

67

Located in the Takarla Gram Panchayat of Narla Block in the Kalahandi district, Rendabahali is a tiny village with a total of 52 homes. In all, there are 254 people, with 31 households belonging to the Schedule Caste and 21 families belonging to the Other Backward Classes. Natural water resources were available, but they were not properly used owing to a lack of strategic planning.

With the prioritising of works by the communities under the direction of the Gram Panchayat, the Climate Resilient Works (CRWs) under Mahatma Gandhi NREGA was recommended by ICRG team. As a result of careful planning, the CRWs created were able to maximise the impact of Mahatma Gandhi NREGA funding by combining water harvesting structures (WHS) with a variety of interconnected features like inlet/outlet, a number of loose boulder check dam (LBCDs), a field channel, and land development of 8.2 ha for 12 families in the command area. INR 4.7 lakh was allocated under Mahatma Gandhi NREGA for the WHS restoration and INR 2.4 lakh for land development works for 12 households.

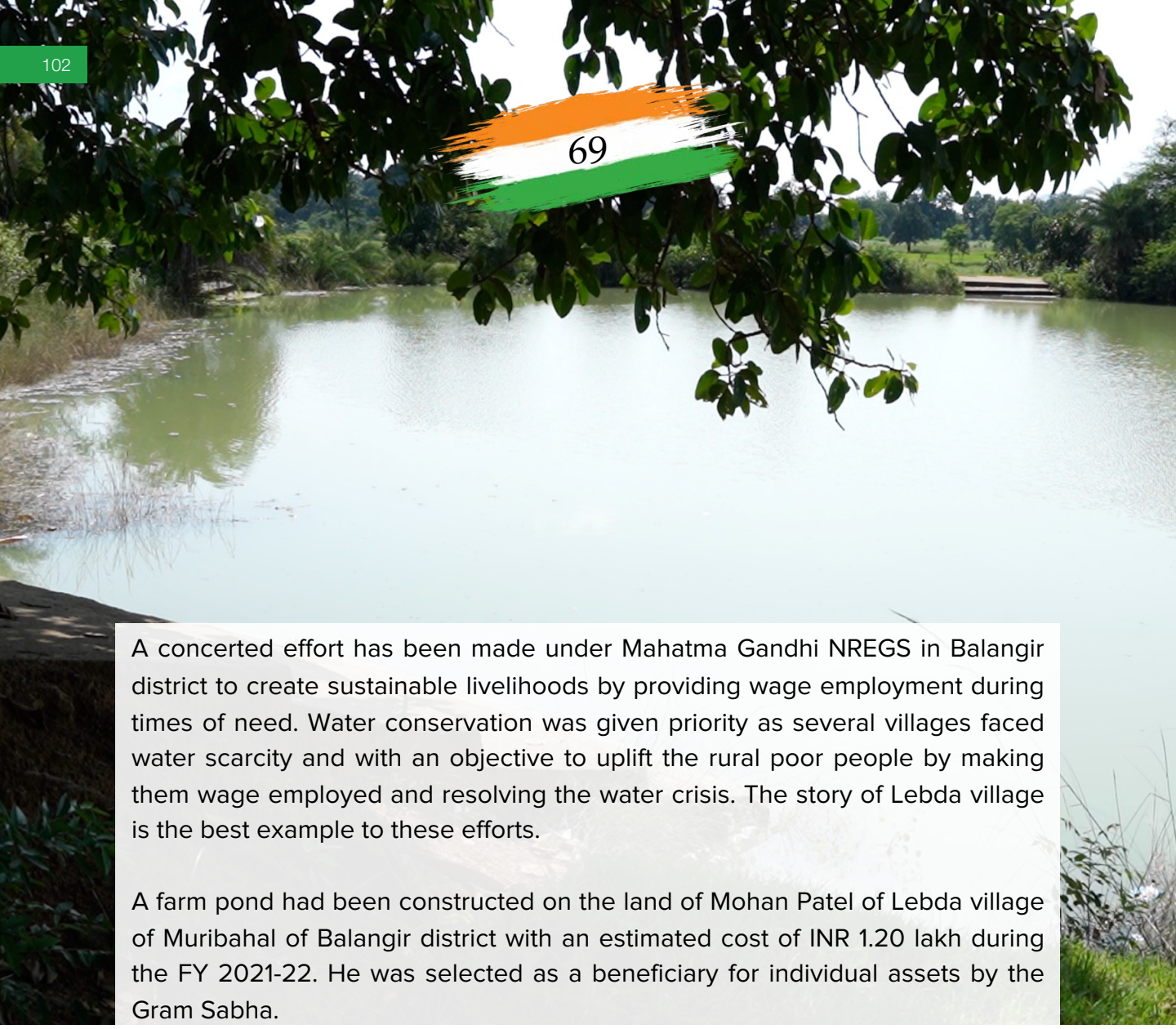
As a result, there was an increased irrigation potential in 17 ha during the Kharif season and 7 ha during the Rabi season. Cropping intensity in the command area has grown with more farmers producing crops in both the Kharif and Rabi seasons.

"The ground water level has risen by up to 1 metre, and the water storage capacity of the Water Harvesting Structures has grown from 26000 cubic meter (cum) to 32500 cubic meter (cum). 10 acres of rice and pulses were grown by us (22 farmers) during Kharif season. Some of us (9 farmers) planted vegetables, watermelons, black and green gramme, and other crops for the first time on five acres of land."
Farmers, Takarla Gram Panchayat

Makardhawaj Sahu, of Kapsipali village of Khaprakhol block has successfully adopted integrated farming utilising the farm pond constructed on his land under Mahatma Gandhi NREGA through convergence with the soil conservation department. Life was not so easy for him initially, but his strong determination and dedication gave him a new identity today. During a Gram Sabha, he put forth the requirement of Farm Pond on his farm land. A team of DRDA, Balangir verified his eligibility, approved, and forwarded the same to Khaprakhol block to allot him a farm pond through convergence with Soil Conservation Department with an estimated cost of INR 1.20 lakh. ICRG team provided technical assistance during the construction of Farm Pond.

After completion of the project, he has emerged as a successful farmer by cultivating tomato, brinjal, chili, long beans, and paddy in both Kharif and Rabi Seasons on the same land holding of 0.50 acres, which has helped him to raise his standard of living.

"Before the implementation of the farm pond project, I used to cultivate only in the Kharif season. I was also doing pisciculture in the farm pond. After digging the pond, I have raised 200 fingerlings and earned INR 12000 last year. By doing vegetable cultivation, I am fulfilling the vegetable need of my family as well as getting a profit of around INR 2000-3000 per month by selling it in nearby market."
Makardhawaj Sahu, Farmer



A concerted effort has been made under Mahatma Gandhi NREGS in Balangir district to create sustainable livelihoods by providing wage employment during times of need. Water conservation was given priority as several villages faced water scarcity and with an objective to uplift the rural poor people by making them wage employed and resolving the water crisis. The story of Lebda village is the best example to these efforts.

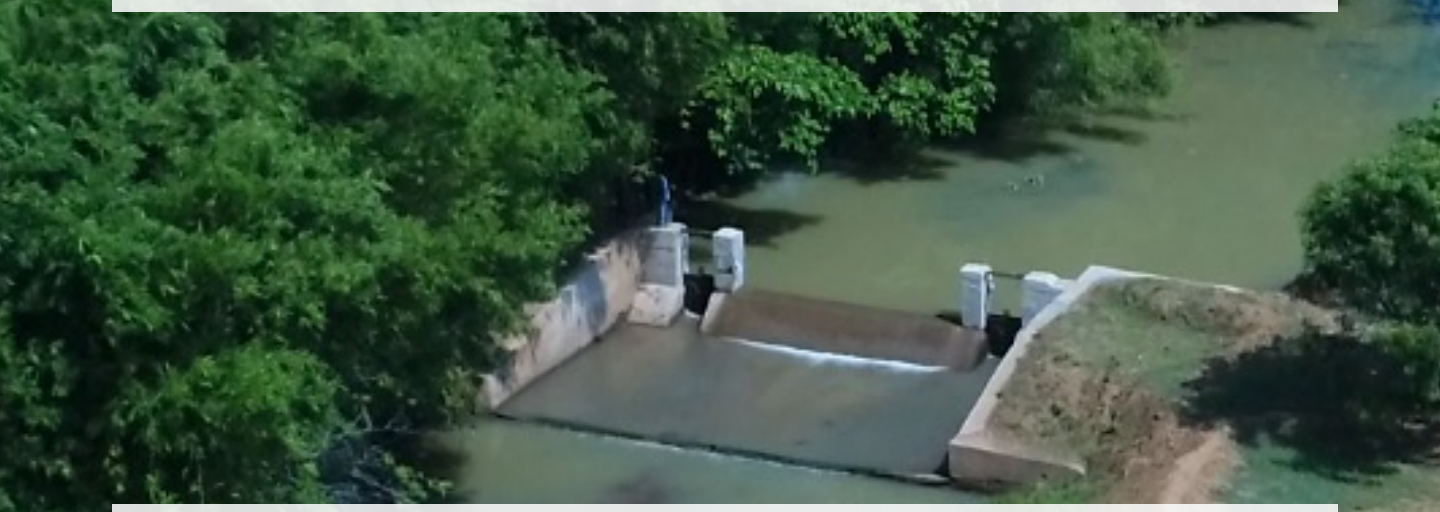
A farm pond had been constructed on the land of Mohan Patel of Lebda village of Muribahal of Balangir district with an estimated cost of INR 1.20 lakh during the FY 2021-22. He was selected as a beneficiary for individual assets by the Gram Sabha.

The block level team with the help of a ICRG team, extended technical guidance. The most important benefit of this construction activity was to provide uninterrupted employment to Mohan Patel under Mahatma Gandhi NREGS. The farm pond constructed not only stores the excess water during the rainy season but also helps Mohan cultivate around the year.

"I am now growing onion and other vegetable crops during Rabi season in my 0.5 acres land holding, which was not possible earlier due to the unavailability of irrigation sources and the early withdrawal of monsoon. I earned Rs 60,000 from vegetable cultivation last year. The pond helps me in irrigating my small farm by providing me with a sustainable livelihood opportunity. Besides, this structure helped me to retain soil moisture for one to two weeks in case of a dry spell during Kharif season."
Mohan Patel, Farmer, Lebda village

70

Dudhiasole village is located under Kendua Gram Panchayat of Samakhunta Block, Mayurbhanj district. Main occupation in the village is agriculture. More than 200 households in the village are dependent on stream water for irrigation and domestic chores. An earthen dam was built across the stream by farmers using mud, stones and sand-bags to divert water to farms and to prevent its overflow. However, this dam was not durable and was damaged frequently. The villagers came to the conclusion that a concrete check dam should be constructed for effective control of the flow of water for irrigation.



The construction of check dam was approved and built under Mahatma Gandhi NREGS with a total cost of INR 10 lakhs, with technical guidance from ICRG team. There was further convergence with other line departments including Integrated Tribal Development Agency (ITDA), Odisha Agro Industries Corporation limited (OAIC) and Odisha Livelihood Mission when the project was implemented on ground. Meanwhile, Dudhiasole residents planned to construct a guard-wall to prevent the influx of water into agricultural fields during heavy downpour.

The cultivated area has increased by 60% i.e. 60 Acres of land. More than 35 farmers got benefitted with the initiative. After construction of guard-walls the flooding has reduced. The other benefits of the check dam include storing of water for the summer season.

"Earlier I used to cultivate paddy only in rainy season. Now I am able to grow two crops in a year. In last summer I cultivated groundnut during Rabi season by investing INR 5,000 and earned INR 40,000. After check dam was constructed, cultivation in the nearby land became possible. I am growing groundnuts in my 2 acres of land during summer seasons. Before the check dam was constructed it was not possible."
Padmalochan Mahanta, Farmer, Dudhiasole village

71

The Badbil village of Keonjhar district has witnessed massive changes with its wastelands being transformed into productive land that is fit for farming. Through convergence, 8 ha of the land that surrounds the village has been treated by Mahatma Gandhi NREGA in convergence with ITDA (Integrated Tribal Development Agency). The village also has two borewells with solar panels (procured through convergence with the ITDA) that are for community use. As part of the land treatment, field bunds and gully plugs have been built under Mahatma Gandhi NREGA to harvest rain water (which will recharge the ground water) and control soil erosion. The work was implemented with the technical guidance and recommendation of ICRG team. **The total cost incurred during the project was INR 6.1 lakhs, benefitting 39.53 acre of land and 44 households.**

Women in the region lead the actions against climate change. Conscientiously, they have worked on presentations that explain the effects of climate change that the region has experienced since 1974 – with detailed experience on changing patterns of rainfall, temperatures, and other parameters/ information that is indicative of the changing climate.

ITDA has supported the community in Badbil extensively. Known for its potato plantations, 45 farmers in the village have directly benefitted from seeds supplied by the ITDA. Farmers like Bhubaneshwar Naik and his wife Meenakshi Naik have even gone a step further by cultivating green peas and tomatoes in addition to potatoes. With proper inspection of his land, ICRG team recommended Bhubhaneshwar Naik for proper treatment and development of the land to make it suitable to agriculture.

"I am managing a banana plantation on my land, which was not possible earlier as the area was not fit for agriculture. Through the support of the ICRG and Mahatma Gandhi NREGA, my land was developed and ITDA has provided me with seeds that allow me to sustain the plantation,"
Mohan Kumar Naik, Beneficiary, Badbil village

72

The Budhabalanga river is an important river that flows through the district of Mayurbhanj to merge into the Bay of Bengal. In the district's Dudhiasole village of Shamakhunta block, a stream named Kanchi flows prior to joining the river in Simlipal. Unfortunately for the 44 families that lived in the area, the Kanchi stream was a fast-flowing water body that caused siltation and coupled with the unpredictability of monsoon patterns, irrigation was suffering.

Villagers put the issue in front of the Gram Sabha where in consultation with ICRG team a check dam was recommended to be built on the stream, so that flow of water can be slowed down and it can be used for irrigation purpose.

A check dam with guard walls on both sides was approved and constructed under Mahatma Gandhi NREGA by Gram Panchayat to mitigate the problem. With a total cost of INR 10 lakhs, **the dam is providing year-round irrigation facilities to not just the 44 families living in Dudhiasole village, but it is built to sustain 24.2 hectares of land in the region and allows farmers to cultivate two cycles of rabi and kharif crops.** Water from the check dam is the main source of irrigation, which has allowed the farmers to successfully earn a livelihood round the year.

"I personally have been growing just one crop in the year, with uncertainty about the results as the monsoon sometimes was not as planned. Today, the situation has changed and I am able to farm throughout the year due to the availability of water,"
Mangal Singh, Farmer, Dudhiasole village

73

In the Bhawanipatna block of Kalahandi district, flooding is a common problem during the monsoons when overflowing streams would ruin crops while eroding soil and bringing silt. ICRG team along with Mahatma Gandhi NREGA functionaries intervened in the area to ensure that the local community is aware about climate change and its effects, whilst also ensuring that mobilisation of resources takes place to benefit those in dire need of climate resilient works. As result of capacity building, villagers soon realised that these flash floods affected both stream banks that ultimately led to the need for a check dam to manage the disastrous outcome of the monsoons.

The check dam was approved and constructed under Mahatma Gandhi NREGA. It allows the cultivation of an additional crop (rabi) on one side of the stream, whilst the other side of the stream has been converted to cultivable land from a wasteland. The dam also collects water that enhances the irrigation potential in the region.

Most of the community in the Bhawanipatna block has benefited from wasteland conversion.

"I have watermelon plantations after the land development initiative levelled my fields and made them suitable for farming."
Binod Bag, Farmer, Bhawanipatna block

"My fields were also barren lands that underwent wasteland conversion, due to which I am now managing a mango plantation that is inter-cropped with watermelons."
Rudra Thapa, Farmer, Bhawanipatna block

74

Convergence is an important aspect of the Mahatma Gandhi NREGA and if it is well executed in the Gram Panchayat, it directly provide small farmers the tools to improve their productivity and to give them the confidence to experiment in their fields for long term impacts/benefits. One such example was set in Shamakhunta block of Mayubhanj district, where Mahatma Gandhi NREGA in convergence with the Odisha Agro Industries Corporation (OAIC) provided farmers with the necessary equipment for lift irrigation – including irrigation pumps, 500 feet of piping and transformers at highly subsidised and affordable costs.

ICRG team provided training to the villagers on climate resilient structures, which can be built in Gram Panchayat to mitigate the problem of water scarcity in the long term. Now the effect can be seen directly in the life of villagers.

"With certainty of water availability, I have been able to diversify my cropping pattern and am cultivating all round the year. I now cultivate almonds, paddy, ground nuts, wheat, mustard, black grams and an assortment of vegetables in my fields".
Soma Barik, Beneficiary, Shamakhunta block

75

At the Biramunda village of Balangir district, villagers were looking for permanent source of water to solve the problem of scarcity during seasons other than monsoon. ICRG team surveyed the area along with Mahatma Gandhi NREGA functionaries and recommended construction of a water harvesting tank which will provide water to approximately 45 families that live in the surrounding 50 acres.

To make the water harvesting tank more efficient, a diversion canal was also constructed, which channelised the water directly into the tank without any wastage. 700 meters in length, the canal is not only improving the functioning of the water harvesting tank, but also providing supplementary income to villagers with daily wages under Mahatma Gandhi NREGA. **The total cost incurred during the project was INR 10 lakh, benefitting 35 acres of land and 45 farmers of the region.**

The construction of field channels at the tail-end of the water harvesting tank are proving to be much more beneficial which has converted even the barren lands into agricultural lands.

"Today we are able to have at least one harvest in the kharif season on the land that, not too long ago which was unsuitable for agriculture."
Farmers, Biramunda village

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