

DOCUMENTATION OF A NUTRITION INITIATIVE: 'MO UPAKARI BAGICHA'

A Collaborative Effort by Odisha Livelihood Mission and Azim Premji Foundation towards Enhancing Nutritional Security through Dietary Diversity in Odisha



Prepared by: Mamata Das

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FOREWORD



Smt. Sujata R Karthikeyan, IAS

Commissioner-cum-Secretary,
Department of Mission Shakti, Government of Odisha.

The world has been in the grip of an unprecedented crisis brought by the Covid-19 pandemic. The severity of the pandemic has affected livelihoods and nutrition security of a large cross section of people across the country. Odisha witnessed a massive reverse migration from other states. In such circumstances, the MO UPAKARI BAGICHA (MUB), an initiative by the Government of Odisha through Odisha Livelihood Mission (OLM) and Azim Premji Foundation (APF), was of immense help in ensuring nutrition in all the participant households across the state. MUB emphasizes enhancing nutritional security through dietary diversity by involving women's collectives. This initiative focuses on empowering rural women through improved knowledge and practices by way of participatory learning methods leading to dietary diversity and enhancement in nutrition at the household level. Establishment of nutrition gardens and a robust mechanism for programme delivery are the main highlights of MUB. The programme is seen to have a direct influence on enhancing nutrition security of communities. The success of this initiative makes it a wonderful example for it to be documented and replicated elsewhere for reaping nutritional benefits for communities.

I thank Oxfam India, the Secretariat of UJAS coalition (National Coalition of Civil Society Organizations), for documenting this initiative and preparing a detailed report on it. The report spells out the entire initiative at length by focusing on its key components such as PLA LANN trainings, nutrition gardens, and backyard livestock activities among others.

The success of this initiative would not have been possible without the combined efforts of all the stakeholders involved in this initiative and especially the SHGs who embraced it wholeheartedly. Congratulations to the entire team. I am hopeful that this report will be able to motivate several other innovative practices contributing to the overall improvement of nutrition security across India.

Commissioner-cum-Secretary

MESSAGE



Ms. Mansi Nimbhal, IAS

SMD-cum-CEO,
Odisha Livelihoods Mission,
Department of Mission Shakti, Government of Odisha.

I am pleased to present the DOCUMENTATION OF A NUTRITION INITIATIVE: 'MO UPAKARI BAGICHA', carried out by Oxfam India, on behalf of UJAS (National CSO Coalition). This nutrition initiative is a collaborative effort by the Govt. of Odisha through Odisha Livelihoods Mission (OLM) and Azim Premji Foundation (APF) towards enhancing nutrition security through dietary diversity in Odisha. The COVID 19 pandemic has pushed back people into unemployment, poverty and has hampered efforts on ending malnutrition. In such a scenario the MUB programme in Odisha has proved to be one of the effective solutions to provide easy and sustained access to nutritious diet to the rural communities.

The primary objective of conducting this study was to share the MUB Initiative and our collective experience and learning with the UJAS partners and other relevant organisations so that they can adapt it according to their context. The document gives a detailed understanding about the initiative and how it is contributing in enhancing dietary diversity and further reducing malnutrition which is central to our existence and very crucial for productive human resources.

I thank all the stakeholders of Mo Upakari Bagicha for their good work in helping different target groups of the community by establishing nutrition gardens and community nurseries, changing behaviour & practices of WSHG members by conducting PLA LANN trainings at SHG level and strengthening backyard livestock promotion activities at the household level.

I also thank the Oxfam India team for being able to meticulously carry out the task of documenting the best practices Mo Upakari Bagicha in Odisha. I am certain that this document will help in replication of similar nutrition interventions in other locations, and contribute in achieving our goal of a healthier society.

SMD-cum-CEO

FOREWORD

In 2019, Oxfam India set up a National Coalition of Civil Society Organizations (CSOs), known as UJAS. The primary objective of UJAS is to deepen health, nutrition and women's economic empowerment (WEE) outcomes under major government programs and schemes like National Rural Livelihood Mission (NRLM), National Health Mission (NHM), Beti Bachao Beti Padhao (BBBP) and Integrated Child Development Scheme (ICDS). UJAS is active across 15 states with a membership of around 325 organisations. Oxfam India is the secretariat of the coalition.

The coalition believes that one of the key strategies to promote better development outcomes is knowledge & evidence generation. It therefore intends to undertake and share policy analysis of schemes as well as document innovative models of Women Economic Empowerment; Health and nutrition developed by the members of the coalition. We hope that this will help in greater uptake of the learnings by various stakeholders like the livelihood missions, line departments, CSOs at state and national level.

The last two years have been very challenging for all especially for the vulnerable sections of the society particularly women. COVID-19 has adversely affected the health and nutrition of women and children. The pandemic has pointed out to the need for greater attention to make populations healthier and more resilient to future shocks.

Given this background, the documentation of '*Mo Upakari Bagicha* (MUB) Programme' – an initiative undertaken by Odisha Livelihood Mission (OLM), Govt. of Odisha and Azim Premji Foundation (APF) – is very timely. The document provides a detailed documentation of the whole process of conceptualization, piloting, scaling up of approaches and strategies adopted by MUB initiative. We sincerely hope that this document will not only help to disseminate the knowledge related to MUB initiative widely, but also inspire the CSOs, other State Rural Livelihood Missions (SRLMs) and Government departments to adopt these learnings in their own context.

We also hope that people involved with nutrition and women's economic empowerment issues across the country will find this report useful.



Ranu Kayastha Bhogal
Director- Policy Research & Campaign
Oxfam India

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I would also like to provide my sincere thanks to the entire management team of OLM under the leadership of Ms. Mansi Nimbai- IAS SMD cum CEO, Dr. Badal Kumar Mohanty-OAS (SB) Additional CEO (Programme Support), Dr. Babita Mohapatra-Additional CEO (Operations) and Ms. Banita Sethy-Additional CEO (Finance).

My sincere thanks to Rajib Kumar Roul, Sr. Programme Manager, APF and Srikant Mohanta, Consultant, APF for their valuable inputs and guidance.

Special thanks to Surjit Behera of PRADAN, Late Debeet Sarangi of Living Farms, and Gautam Pradhan of Harsha Trust for taking the time and effort to walk us through the entire programme. I would like to thank the BLRPs in all districts who took time and effort to provide their inputs on the programme.

I express my sincere thanks to the DPMs, BPMs, BLCs, Master Trainers, YPs and MCs of Kalahandi, Rayagada, Mayurbhanj, Keonjhar and Jagatsinghpur for giving deep insights into the implementation of the MUB initiative at the ground level.

Sincere thanks to the officials of the Odisha state government at the district level especially the PD-DRDAs, DSWOs, BDOs, DDHs, BVOs, CDPOs and representatives of various line departments who spared time to provide us with their inputs on the programme.

Finally, special gratitude to the SHG women and community cadres across all districts who shared their perspectives and experiences about the programme with me.

Mamata Das
Consultant,
Oxfam India

List of Abbreviations

AHO	Assistant Horticulture Officer
APF	Azim Premji Foundation (Formerly Azim Premji Philanthropic Initiatives)
APO	Additional Programme Officer
ASHA	Accredited Social Health Activist
ATM	Automated Teller Machine
AWC	Anganwadi Centre
AWW	Anganwadi Worker
BDO	Block Development Officer
BLC	Block Livelihood Coordinator
BLRP	Block Level Resource Person
BMMU	Block Mission Management Unit
BPC	Block Project Coordinators
BPM	Block Project Managers
BYP	Backyard Poultry
CDPO	Child Development Project Officer
CEO	Chief Executive Officer
CLF	Cluster Level Federations
COVID	Corona Virus Disease
CRF	Common Results Framework
CRP-CM	Community Resource Person-Community Mobiliser
CSO	Civil Society Organization
DDH	Deputy Director of Horticulture
DHH	District Headquarter Hospital
DMMU	District Mission Management Unit
DoH	Directorate of Horticulture
DPC	District Project Coordinators
DPM	District Project Managers
DRDA	District Rural Development Agency
DSWO	District Social Welfare Officer
EAG	Empowered Action Group
ELSP	External Livelihoods Support Person
EM	Effective Microorganisms
FAARM	Food and Agro-Ecological Approaches to Reduce Malnutrition
FAO	Food and Agriculture Organization
FGD	Focus Group Discussions
FLW	Front Line Worker
GBD	Global Burden of Disease
GoO	Government of Odisha
GP	Gram Panchayat
GPLF	Gram Panchayat Level Federation
GRS	Gram Rozgar Sewak
HH	Household
ICDS	Integrated Child Development Services
IDI	In-Depth Interview
IEC	Information, Education and Communication
IMR	Infant Mortality Rate
INR	Indian Rupee

ITK	Indigenous Technical Knowhow
IYCF	Infant and Young Child Feeding
JSLPS	Jharkhand State Livelihoods Promotion Society
KM	Krishi Mitra
MBK	Master Bookkeeper
MC	MGNREGS Coordinator
MDD	Minimum Dietary Diversity
MDD-W	Minimum Dietary Diversity for Women
MDM	Mid-Day Meal
MGNREGS	Mahatma Gandhi National Rural Employment Guarantee Scheme
MIS	Management Information Systems
MMR	Maternal Mortality Rate
MoRD	Ministry of Rural Development
MoU	Memorandum of Understanding
MTs	Master Trainer
MUAC	Mid-Upper Arm Circumference
MUB	Mo Upakari Bagicha
NBS	Need Based Support
NFHS	National Family Health Survey
NG	Nutrition Garden
NHM	National Health Mission
NRC	National Resource Center
NRETP	National Rural Economic Transformation Project
NRLM	National Rural Livelihoods Mission
ODK	Open Data Kit
OLM	Odisha Livelihoods Mission
OMBADC	Odisha Mineral Bearing Areas Development Corporation
ONAP	Odisha Nutrition Action Plan
OP	Open-pollinated
OPM	Oxford Policy Management
OSSC	Odisha State Seeds Corporation
PD	Project Director
PD & DW	Panchayati Raj and Drinking Water
PD-DRDA	Project Director-District Rural Development Agency
PDS	Public Distribution System
PLA-LANN	Participatory Learning & Action – Linking Agriculture & Natural resource for Nutrition
PM	Prani Mitra
PRI	Panchayati Raj Institution
PVTG	Particularly Tribal Vulnerable Group
RLC	Reflection, Learning and Change
RNGO	Resource Non-Government Organisation
SC	Scheduled Caste
SDG	Sustainable Development Goals
SHG	Self Help Groups
SMD	State Mission Director
SMMU	State Mission Management Unit
SOP	Standard Operating Procedure
SPM	State Programme Manager
ST	Scheduled Tribe

ToC	Theory of Change
ToT	Training of Trainers
UNICEF	United Nations Children's Fund
VHND	Village Health Nutrition Day
VO	Village Organization
WASH	Water, Sanitation and Hygiene
WCD	Women and Child Development
WHO	World Health Organization
YP	Young Professional

Executive Summary

Background

Maternal and child health is crucial to both individual and national development. Nutrition is the foundation for health and ensuring that adequate attention is paid to it is must for development, poverty reduction and protecting human rights. According to the World Bank (2017), the return on nutritional investments can be as high as 1: 35, i.e. ranging between \$4 to \$35 returns on every dollar invested in a quality diet.¹

Odisha is one of the Empowered Action Group (EAG)² states which has poor maternal and child health outcomes. The state has been working towards correcting this situation and it has shown steady improvement especially over the past decade. Though the malnutrition percentage showed a decrease over the period till 2018, the numbers were still significant and warranted further interventions. It is in this regard that the state government partnered with Azim Premji Foundation (APF) to work towards specific malnutrition reduction targets. Hence the partnership primarily arose from the Govt. of Odisha's to improve its standing in the malnutrition charts where it was placed in the bottom among states in India.

APF identified combating malnutrition as one of its strategic areas of work. On 21st Dec 2015, the Odisha government signed a MoU with the APF to reduce the malnutrition rate and ensure development of women in the state by 25% over a period of 10 years. A strategic plan termed the Odisha Nutrition Action Plan (ONAP) was developed as a joint initiative of Government of Odisha and APF to address malnutrition among women, adolescent girls and children in Odisha by focusing on "nutrition-specific", wider "nutrition sensitive" and governance related measures. This involved the convergence of 10 line departments of the government to pool in their expertise to address malnutrition. Each department made plans about their sectoral interventions.

The 'Mo Upakari Bagicha' (MUB) Programme

The MUB initiative is one of the largest nutrition garden interventions in the world. The unique aspect of the programme is that unlike other programmes that are implemented privately by NGOs, MUB is being implemented by the state government.

The foundation of MUB was a project on dietary diversity along with PLA-LANN modules which was piloted in two districts of Odisha by Living Farms. Learnings from the field were analyzed along with takeaways from other projects like SHOUHARDO in Bangladesh, SUHAARA in Nepal, and the PCI supported programme implemented by BRLPS in Bihar. Based on all these projects, APF designed the programme and the implementation plan which OLM agreed to implement through SHGs aligned to them. This programme was renamed as Mo Upakari Bagicha (MUB) on 18th October, 2019. The overarching objective of the MUB initiative is to enable reduction of malnutrition amongst key target groups which include adolescent girls, pregnant and lactating women, and children below 5 years of age.

¹ <https://blogs.worldbank.org/health/why-nutrition-smart-development-investment>

² The Ministry of Health and Family Welfare, India established Empowered Action Group (EAG) in 2001 to have special focus by monitoring and facilitating the attainment of national health goals in some of these states which are demographically lagging behind. Under this group 8 states such as Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Rajasthan, Uttarakhand, Uttar Pradesh and Assam has been identified as EAG states.

Odisha Livelihoods Mission (OLM), which is part of the Panchayat Raj Department of Government of Odisha works for the rural poor through promotion of sustainable livelihoods. It works across all 30 districts of Odisha through development of community managed institutions. OLM was entrusted with the execution of the project and 3 key Resource NGOs (Living Farms, PRADAN, Harsha Trust) were roped in because of their technical expertise and extensive experience of working in key regions of Odisha. The implementation was done through SHGs affiliated to OLM. Hence OLM assumed a critical role under ONAP to address the malnutrition situation by promoting dietary diversity.

The MUB initiative has three components – a) PLA-LANN, b) promotion of nutrition gardens at the household level and c) promotion of livestock. The PLA-LANN meetings consist of 14 sessions which enable the SHG women to understand and discuss issues related to nutrition and health and plan solutions to address these issues. Nutrition gardens are small patches of land, typically in the backyard of households where the trained community members grow their own vegetables and fruits. The cascading model was used for rolling out the training, where master trainers were trained by RNGOs first, post which these master trainers trained the community cadres based at GP level and who in turn trained the community members.

The project was executed in 2 phases – a pilot phase implemented by Living Farms in Rayagada and Kalahandi districts of Odisha during 2016-2018 which was further scaled up with 3 RNGOs in 107 blocks covering 100,000 nutrition gardens during 2018- 2021 in the second phase. This was followed by implementation of MUB across the state in convergence with MGNREGS in 2020-2021. OLM's existing structure was tapped to strengthen the project delivery. A dedicated nutrition vertical was created in OLM and the existing community cadre structure was tapped to deliver the programme at the ground level.

When phase 2 of the MUB initiative was underway in 2020, the onset of COVID-19 pandemic witnessed reverse migration in which people returned to the villages across the state. The MUB initiative was found to be very helpful in creating food security for such people as they could grow their own vegetables and did not have to depend on buying them especially when there was no income and savings were getting depleted. Seeing this, the state government decided to converge MUB with MGNREGS and allocated an additional INR 500 crores to the MUB initiative. Thus, the programme grew to become critically important in addressing malnutrition in the state especially during the time of Covid. During the initial phase, the programme was implemented in 107 blocks in 17 districts. Subsequently, it was scaled up to be implemented in 314 blocks in 30 districts.

Methods and data

Qualitative methods were adopted to collect information for documenting the MUB initiative. Field work was carried out in February 2021 in 5 districts of Odisha. These 5 districts were selected on the basis of geographic features, high malnutrition rate, migration, type of support provided and involvement of RNGOs. A total of 12 villages from 5 selected districts were covered for collecting first-hand information from the ground on implementation of the MUB initiative. Information was gathered through Focus Group Discussions (FGDs) with SHG women and community cadres. In addition to this, interviews were also carried out with SHG women, community cadres, representatives of partner organizations and government functionaries. Information was collected on the processes undertaken in the MUB initiative and their impact on the target population.

Highlights

The key observations from the study can be grouped into achievements, enablers, and areas of improvement.

- Since its introduction in 2019, MUB has been able to reach all 30 districts of the state, helped the target population through a strong convergence between different stakeholders and helped to increase their dietary diversity.
- The MUB initiative was able to develop into a nationally replicable model for increased and diversified household food production and consumption by rural families, in combination with nutrition education. The MUB initiative has already been adopted by states like Jharkhand and Maharashtra.
- The Govt. of Odisha identified MUB as an important intervention to help migrant returnees for mitigating the impact of COVID-19 pandemic and improve livelihood. MUB was converged with MGNREGS and an amount of INR 500 crores was sanctioned.
- 4,70,000 women have been trained on PLA – LANN, nutrition gardens and livestock development.
- 424,000 nutrition gardens have been established, which has contributed towards HH dietary diversity.
- 11,074 community cadres have been trained to deliver the MUB initiative across the state.
- Training modules and IEC materials were developed both in English and Odia. English training material was developed specially to meet the requirements of practitioners from other states

Feedback from the sample target population has shown that the MUB initiative has enhanced their dietary diversity and reduced household expenditure on vegetables. The project has created a well-trained pool of resource people who have reached the target areas and encouraged and trained community members to establish nutrition gardens. Most importantly, the project has enabled a change in the community knowledge and behaviour towards nutrition. Community members now understand the importance of investing in good dietary habits. The project also played an important role during the tough COVID-19 months and nationwide lockdown in 2020, when savings were low and incomes were negligible mostly in rural areas of the state. Nutrition gardens enabled uninterrupted food supply to the people during that period. In addition, good livestock management helped community members to realize higher productivity from nutrition and economic perspectives. New techniques like Azolla cultivation for livestock feed were introduced which kept community members involved in the project. The project saw a high level of coordination between OLM cadres, RINGOs, state government personnel, and FLWs all of which helped the project in achieving a good amount of success.

Needless to say, there are areas of improvement which need to be taken up in order to make the process better and help it become more scalable. There were challenges in seed procurement, limited scope for landless people, MGNREGS-related wage delays, inadequate human resources allocation to handle the spread of the project, the project's reliance on paper-based MIS, among others. These need to be ironed out to make all components of the project work as an integrated unit.

From an overall perspective, the MUB initiative has had a great start and importantly its acceptability amongst community members is a good sign that the thought process and planning is on the right path. The Japanese system of continuous incremental improvements (Kaizen) will enable the project to really help all stakeholders reach the target they have set out to achieve.

1.1. Background

According to ‘The State of Food Security and Nutrition in the World Report (2020)³, around 14% of India’s population is undernourished. Being a populous country, the absolute number is quite high at around 189 million. It also states that about 34.7 million children under five have stunted growth and that 20% of children under five suffer from wasting. High prevalence of low birth weight, high morbidity and mortality among children and poor maternal nutrition continue to be major nutritional concerns in India. According to the Global Nutrition Report (2020)⁴, 51.4% of women in reproductive age in India are anemic. India State-Level Disease Burden Initiative⁵ as part of Global Burden of Disease (GBD) 2017 reveals that malnutrition accounted for 68% of the deaths of children under five years of age in India. Child and maternal malnutrition increases the risk of neonatal disorders, nutritional deficiencies, diarrhoeal diseases, lower respiratory infections, and other common infections which lead to high mortality rates. All of these also lead to increased economic disparities as poorly nourished children who survive eventually grow into adults with reduced skill sets resulting in very limited ability to be economically productive.

There are multiple interventions in India at both national and state levels which have helped reduce the numbers gradually. The Public Distribution System (PDS), Integrated Child Development Scheme (ICDS), Mid-Day Meal (MDM) programmes and Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) have been rolled out to combat nutrition deficiency particularly in the rural areas. ‘Poshan Abhiyaan 2018-22’, an intervention by the central government is designed to reduce child under-nutrition (stunting and underweight) and low birth weight by 2% a year, and anaemia across age groups by 3%, and create a mass movement for good nutrition in the country in general. However, a lot still needs to be done on a continuous basis for India to get close to the targeted numbers.

Odisha, a state blessed with natural resources, is ironically at the bottom of the nutrition charts among states in India. The Sample Registration System report 2018 shows that the infant mortality rate (IMR) is 40 and the Maternal Mortality Rate (MMR) is 150. According to the National Family Health Survey 2015-16 (NFHS-4), only 54.9% children between 6-8 months receive solid and semi-solid food and breast milk and 8.9% children in the age group of 6-23 months receive adequate diet. 51% of women in the age group of 15-49 years and 44.6% children in the 6-59 months age group are anemic in the state. However, the state has invested in health and nutrition programmes with special emphasis on the poorest districts, and these have shown encouraging results. The Odisha state government was the first to establish a nutrition budget while investing in an effective delivery mechanism of its schemes. Self Help Groups (SHGs) have also helped in extending the reach of ICDS and other initiatives.

As per NFHS-4, in the past decade, the percentage of stunted children and underweight children have come down from 45% to 34% and 41% to 34% respectively, which though noteworthy, are still high. Needless to say, nutrition in the state is a top priority and along with stakeholders like Azim Premji

³ FAO, IFAD, UNICEF, WFP and WHO. 2020. The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets. Rome, FAO. <https://doi.org/10.4060/ca9692en>

⁴ <https://globalnutritionreport.org/resources/nutrition-profiles/asia/southern-asia/india/>

⁵ Indian Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation. *India: Health of the Nation's States - The India State-level Disease Burden Initiative*. New Delhi, India: ICMR, PHFI, and IHME; 2017

Foundation (APF), efforts are on to create a system which delivers results and has the capability to achieve nutritional goals in the state.

1.2. About National CSO Coalition (UJAS) Set up by Oxfam India

Oxfam India is a rights-based organization that fights poverty and injustice by linking grassroots programming through partner CSOs to local, national and global advocacy and policy-making. It acts as the Secretariat of the National Coalition of Civil Society Organization – UJAS, which is a collective platform of 325 organizations spread across 15 states in India and works in the areas of health, nutrition and women’s economic empowerment with a special emphasis on marginalized communities. The coalition aims to further deepen the policy outcomes envisaged under government flagship programmes like National Rural Livelihoods Mission (NRLM), National Health Mission (NHM), ICDS and POSHAN Abhiyan.

With a national level platform spread pan-India, knowledge sharing and developing resource groups on various development themes is one of the core mandates of UJAS. Through its learning and sharing initiatives, the coalition intends to build capacities of its member CSOs for adoption and replication of new ideas and models which have been found successful in terms of achieving the desired results.

1.3. Best Practice Documentation: Core Mandate of UJAS

UJAS believes that documenting new ideas and innovative models of different health, nutrition and women’s economic empowerment initiatives and disseminating them among its members CSOs, other stakeholders, networks and other organizations will enhance their knowledge to adopt and replicate such ideas or models in their operational areas keeping in tandem with their local context. It will also bring in additional recognition for the implementing organization. Another important intention for documenting the successful models is to understand what does not work and why, so that the learnings can act as lessons for future planning of other programmes.

1.4. Documenting the Mo Upakari Bagicha (MUB) Initiative of Odisha

While planning for documenting the successful models/stories, UJAS came across with an initiative undertaken by Odisha Livelihood Mission (OLM)⁶ in collaboration with Azim Premji Foundation (APF)⁷. As part of its mandate to address the health and nutrition aspects across the state, OLM implemented a project called Mo Upakari Bagicha (MUB), which means ‘My beneficial garden’ with support from Azim Premji Foundation (APF). The initiative aims at improving the nutritional status of women and children across the state. The main activities of the project include setting up of nutrition gardens and livestock development for targeted households across all districts. The primary objective here is to enable the beneficiaries to grow nutritious vegetables and rear livestock for their own consumption and make it a part of their lifestyle such that the core issue of malnutrition is addressed comprehensively.

⁶ Odisha Livelihoods Mission (OLM) is a registered society working under the Panchayat Raj & Drinking Water Department of Government of Odisha for enhancing the socio-economic condition of the rural poor through promotion of sustainable livelihoods. The society is mainly responsible for implementing the National Rural Livelihoods Mission (NRLM), an initiative by the Govt. of India. The mission's aim is to enhance social and economic status of the rural poor of all the blocks of 30 districts of Odisha through development of self-sustained and community managed institutions.

⁷ Azim Premji Foundation (APF) is an organisation promoted by Mr. Azim Premji who is a well-known business leader and philanthropist. It aspires to help create a just, equitable, humane and sustainable society by making grants. Their areas of intervention include Vulnerable Groups, Nutrition and Governance.

This initiative of OLM was found to be successful in terms of achieving its objectives, developing a convergence platform for various line-departments, reaching out to the most vulnerable groups and effective utilization of budgetary provision. The project has also been able to contribute towards mitigating the additional nutritional challenges posed by the COVID - 19 pandemic by ensuring availability of nutrition (fruits and vegetables, eggs and meat) at the household level. Hence, UJAS commenced the documentation of this initiative with the following objectives:

- Review the available background materials of the project to have a thorough understanding about the project goals, objectives and desired outputs and outcomes.
- To have a concrete understanding about the initiative through a multi-stakeholder discussion and interaction.
- Document the whole process starting from the inception of the project to achieving the desired goals and having positive impact at the community level.
- Collect and document success stories from the field to highlight the impact of the initiative.

It is envisaged that this document will help the concerned government departments, the coalition members, civil society and other stakeholders to understand the project components, processes and its contribution in terms of measures taken towards improving the nutrition status of women and children in the state. It is also expected that this document will capacitate other organizations and other State Rural Livelihood Missions (SRLMs) to ideate and adopt similar models in their operational areas customizing it as per the local context.

1.5. Methodology Adopted in the Documentation Process

The following steps were adopted while documenting the MUB initiative:

1.5.1. Review of documents

All available documents like concept notes, strategic papers, evaluation reports, process documents, Standard Operating Procedures (SOPs), training modules and published articles were reviewed which helped in developing a clear understanding about the concept of MUB, its objectives and the implementation process. This also included review of secondary literature which centered around the health and nutritional environment of the state and government policies in this regard.

1.5.2. Development of Research Tools

Qualitative data collection method was adopted to collect evidence from the implementation areas of the MUB initiative for recording the successes of the MUB initiative. In-depth Interview (IDI) guides were developed to interview multiple key stakeholders of the project. Similarly, a Focused Group Discussions (FDG) guide was also prepared to conduct discussions with target groups in the selected villages. The main project components consisting of strategies, implementation process, intended outcomes and role of stakeholders were included in these study tools. The detailed list of participants involved in this process is in **Annexure-2**.

1.5.3. Field Visits and Data Collection

The field work for this study was carried out for a period of 20 days during the last week of January 2021 to mid-February 2021, to collect data from the selected sampled areas. It was decided to collect data from 5 sampled districts of the state - Kalahandi, Rayagada, Sundargarh, Keonjhar and

Jagatsinghpur (refer Pic 1). The districts were selected as per the below mentioned criteria and it was anticipated that the district selection criteria will help in having a fair representation across the state.

- Districts with different geographic features
 - Eastern districts (Coastal areas)
 - Southern districts (Tribal and hilly areas)
 - Western districts (Mining zones)
 - Northern districts
- Tribal and remote areas with high malnutrition among women and children, as per NFHS 4 data
- Migration-prone districts where MGNREGS allocated more resources in terms of wages

Then, in each of these 5 districts, two blocks were selected in consultation with the state and district level Nutrition team of OLM considering the following criteria.

- Blocks which had direct support by BLRPs/RNGOs
- Blocks where need-based support was provided by BLRPs/RNGOs
- Operational areas of all knowledge partners (RNGOs)

In each block, one Panchayat was selected and in each Panchayat one village was covered through purposive sampling method, except in Pandakamal Panchayat of M. Rampur block in Kalahandi district, and Kendeipasi Panchayat of Patna block in Keonjhar district where two villages each were covered. Of these two additional villages, one was covered to observe *Pushti Mahotsav*⁸, and the other was suggested by the project staff as it was in close vicinity. So, a total of 12 villages from 10 panchayats were selected in consultation with district and block level OLM officials, RNGOs/BLRPs and community cadres. The Panchayats where the intervention resulted in few successful outcomes (in terms of high community participation, convergence of support, presence of active community cadres, etc.) were selected for data collection. The complete list of selected districts, blocks, panchayats and villages covered is presented in the Table-1 below.

Table 1 – List of selected villages			
District	Block	Panchayat	Village
Kalahandi	M. Rampur	Pandakamal	Fatamunda and Mahulpada
	Lanjigarh	Champadeipur	Sana Jamkiheju
Rayagada	Muniguda	Kumudabali	Dhobagudi
	Chandrapur	Dangsoroda	Pandrakhal
Sundargarh	Tangarpali	Mahulpali	Bandhapli
	Balisankra	Tildega	Tildega
Keonjhar	Telkoi	Jagamohanpur	Tungurbahal
	Patna	Kendeipasi	Kendeipasi and Mahisamundi
Jagatsinghpur	Tirtol	Garam	Alana
	Ballikuda	Krushnadaspur	Khankarpur

⁸ Pushti Mahotsav - A festival organized by OLM in multiple locations in Odisha where all types of foods available locally and from Nutrition gardens are displayed by the community members.



Pic. 1 – Sample districts and blocks of the study

An initial discussion was held with the OLM nutrition team, APF staff and RNGO representatives (from PRADAN, Harsha Trust and Living Farms) at the state level to understand the implementation process and their experience with the project. Similarly, in-depth interviews were conducted with officials of OLM and other line departments (district and block levels) to understand the field level processes, impacts, and challenges. At the district level, discussions were held with PD-DRDA, DDH, and DSWOs. At the block level, discussions were held with BDOs, APOs, AHOs, and CDPOs to understand their views on the project and also to understand the challenges being faced at the community level. BLRPs and Master Trainers were also interviewed to understand their roles, experience and challenges faced.

In addition, data collection was carried out at the community level to have a detailed understanding of the practices followed in the MUB initiative. At the village level, FGDs were conducted with the SHG members and community cadres {CRP-CMs, Krishi Mitras, Prani Mitras, Master Book Keepers (MBKs)} which was followed by visits to nutrition gardens and other interventions like Azolla ponds, Backyard Poultry (BYP) practices etc. Interviews were also conducted at the community level with some individual SHG members to document a few success stories. A list of success stories is presented in **Annexure-1** of this document to highlight the impact of the MUB initiative at individual, household and community levels.

The following table provides the details of numbers of interviews and FGDs conducted and total number of participants covered during field visit.

Table 2 - No. of IDIs & FGDs conducted and no. of participants interviewed		
Activities	Numbers	Number of participants involved
FGDs with SHG members	12	360
FGDs with the community cadres	11	110
IDIs with the target women	20	20
Discussions with BLRPs	14	14
Discussions with Master Trainers	13	13
IDIs with government stakeholders	60	60
Discussion with OLM state nutrition team	1	4

Activities	Numbers	Number of participants involved
Discussion with RNGOs	6	15
Discussion with APF	2	2
Total	139	598

1.6. Challenges Faced while Documenting the Initiative

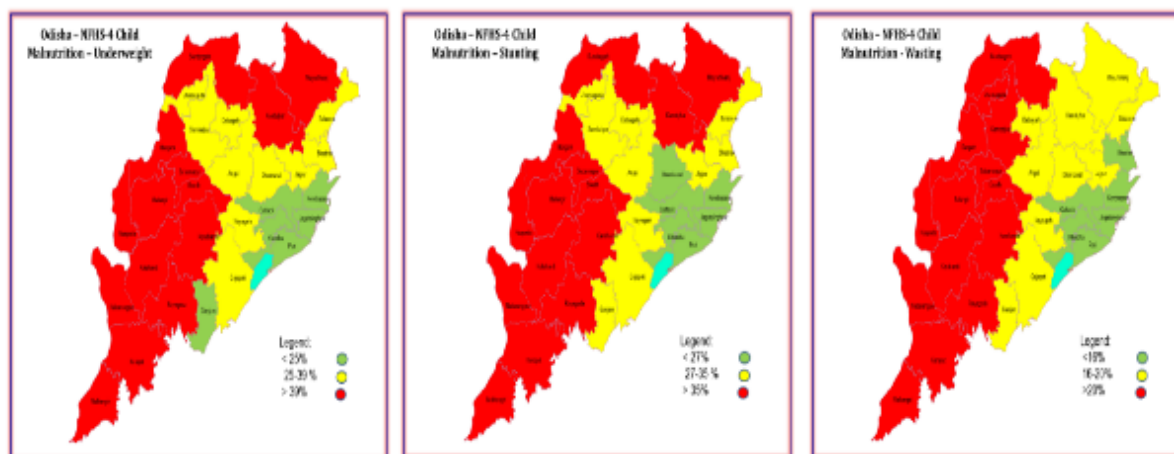
The time allocated for field study was limited and there were difficulties in meeting the government officials as they were at times occupied with visits of ministers and higher officials. There were also availability issues of officials due to their prior commitments. One more challenge was that the timing of the study coincided with the end of the Rabi season which meant that during field visits, many nutrition gardens were not in their prime state. This resulted in visits being done only to the nutrition gardens which were functional.

1.7. Limitation in Documenting the Initiative

The major limitation was the lack of a baseline study of the project due to which the achievements and impacts couldn't be compared with baseline data. For example, dietary diversity baseline data was not available and so the study relied more on feedback and perspectives of the participants who were interacted with during data collection.

2.1. Rationale of the Mo Upakari Bagicha (MUB) Initiative

Odisha has made steady progress in reduction of malnutrition in the state through programmes like the Integrated Child Development Service (ICDS), National Health Mission (NHM), Mid-Day Meal (MDM), Mission Shakti (Shakti Varta), Mamata and Swachh Bharat Abhiyan to support better nutrition for children, adolescents, pregnant women and lactating mothers. However, with a large percentage of population being poor (32.59% as per NITI Aayog's SDG India Index Baseline Report⁹), malnutrition continues to be a challenge for the state. As per NFHS-4 (2015-2016), the malnutrition situation in Odisha (*refer Pic 2*), though improved when compared to the findings of NFHS-3, still has 34.7% of children under the age of five suffering from stunted growth. 34% of the children are underweight and 20% of the children are wasted. Close to 45% of the children under the age of 5 are anemic. This has decreased from 65% ten years ago but is still a substantial figure. Close to 48% of pregnant women and 55% of lactating women in the state are anemic. The malnutrition rate is higher in backward tribal districts like Malkangiri (51.8%).



Pic 2 - Status of malnutrition of children in Odisha (Source: NFHS 4)

As part of its efforts and commitment towards improving the nutritional status of women and children through effective and sustainable service delivery while creating demand for services, especially amongst the poorest and the populations in the most difficult-to-reach/ remote areas, the Govt. of Odisha entered into a Memorandum of Understanding (MoU) with APF, in December 2015 and developed a multi-sectoral Odisha Nutrition Action Plan (ONAP). APF has identified Odisha as one of the strategic areas of its work for addressing malnutrition in India. This initiative along with the Government of Odisha was developed keeping in mind the Sustainable Development Goals (SDGs)¹⁰ and World Health Assembly target (*refer pic 3*), through a multi-sectoral convergence model involving multiple line-departments and civil society organizations.

⁹ http://niti.gov.in/writereaddata/files/SDX_Index_India_21.12.2018.pdf

¹⁰ India is a signatory to the Sustainable Development Goals (SDG) which has given a call for ending all forms of malnutrition by 2030.

As per ONAP, considering the complementarity of nutrition-specific and nutrition-sensitive-interventions, the MoU between Government of Odisha and APF endeavors to harness inter-departmental synergistic interventions in the state. The overall target of the partnership is to bring about reduction of under-nutrition in Odisha by 20-25% percentage points in 8-10 years, taking NFHS-4 (2015-2016) as the baseline. This includes reduction of following in the state:

- Under 5 stunting
- Prevalence of under 5 underweight
- Prevalence of under 5 wasting



Pic 3 - Nutrition targets to be met by 2025, WHO

Box 1 - APF's inputs on programme towards reducing malnutrition in state of Odisha includes:

- Setting up an APF Nutrition team
- A nutrition secretariat set up with Government of Odisha
- A technical and management support unit of nutrition and cross cutting experts housed in the department of WCD to lead institutional strengthening, data management, quality strengthening of schemes, services and scale up
- CSO led initiatives on dietary diversity, downward accountability, innovative concepts and community led initiatives
- Support to mass communication and social mobilization drives
- Creating, coordinating and maintaining networks and partnerships and setting up CSO led advisory council on nutrition sensitive programme
- Monitoring and evaluation

A Common Results Framework (CRF) was developed by the Government of Odisha which was in turn based on the Lancet Series on Maternal and Child Nutrition¹¹ where nutrition interventions are sub-classified into nutrition-specific and nutrition-sensitive categories, to provide strategic direction to achieve nutrition targets in a phased manner. CRF made the government the central spearhead in the efforts to achieve the goals on nutrition, along with critical partners like APF. The key result areas were:

- Increased demand and improved delivery of nutrition related services & entitlements
- Increased state capacity & commitment to nutrition
- Improved multi-sectoral planning and coordination
- Improved political commitment and leadership for nutrition

¹¹ <https://www.thelancet.com/series/maternal-and-child-nutrition>

As part of ONAP, key government departments (refer Box 2), developed action plans in consultation with APF to implement proposed activities over the three years commencing from 2017. A nutrition secretariat was proposed to be set up to enable and strengthen inter-departmental convergence in planning and implementation at state and district levels.

Box 2 - Key departments in the GoO, committed to fulfilling the State's nutrition agenda are:

- Women and Child Development
- Health & Family Welfare
- Fisheries & Animal Resources Development
- Panchayati Raj & Drinking Water
- Agriculture and Farmers' Empowerment
- ST & SC Development, Minorities & Backward Classes Welfare
- Rural Development
- Food Supplies & Consumer Welfare
- School & Mass Education Department
- Sports & Youth Services Department

The involvement of OLM came up as part of the action plan drawn out by the Department of Panchayati Raj & Drinking Water, where one of the critical components was to promote nutrition-sensitive livelihood programmes.

OLM had the advantage of last mile coverage through its robust institutional network, community cadres and quality human resources at the state, district and block levels with a strong livelihood mandate for extreme poor and vulnerable communities.

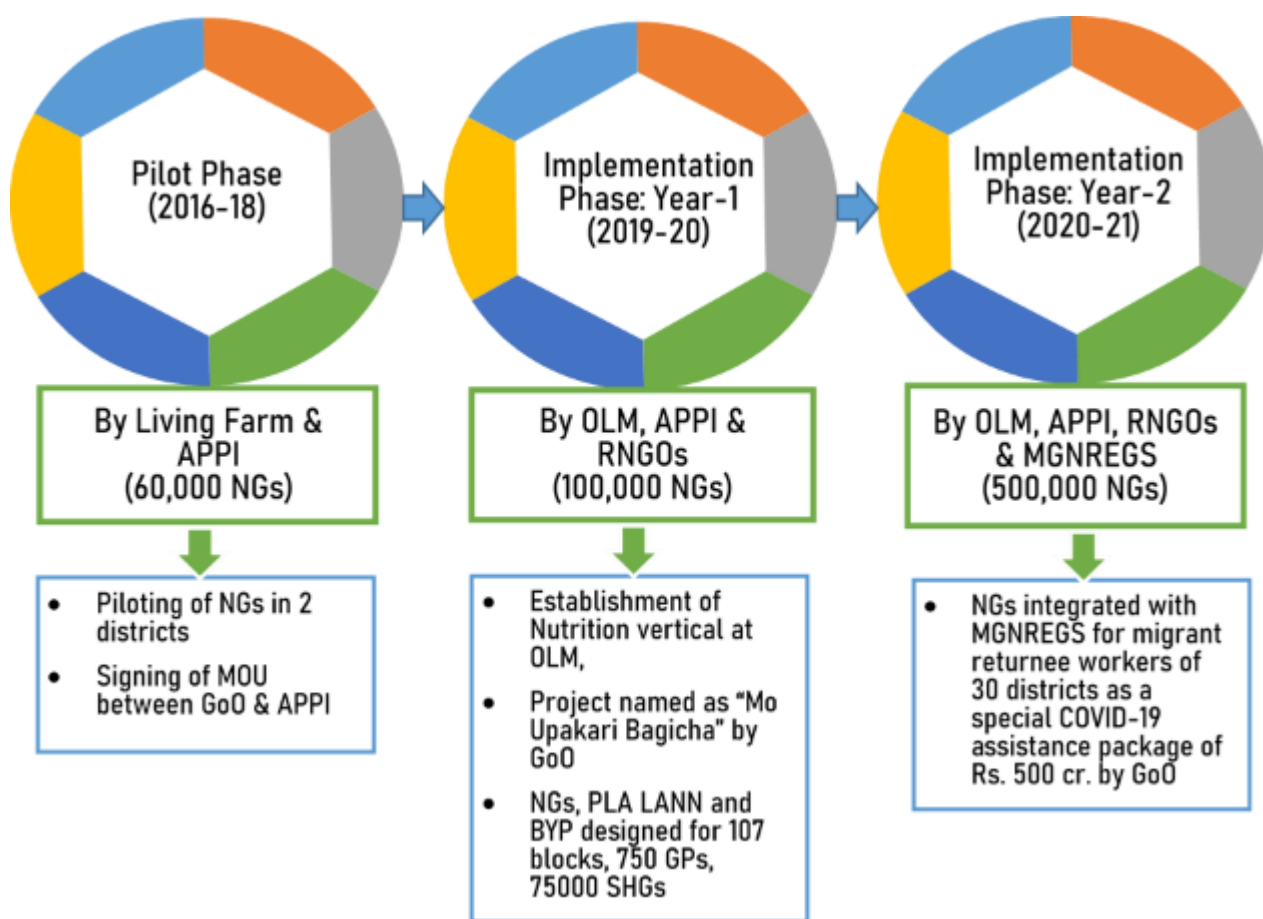
2.2. Project Objectives

The MUB initiative was developed by OLM with the support of APF to improve nutritional status of women and children across the state by targeting lactating and pregnant women, adolescent girls, and children below 5 years. Promotion and mainstreaming of dietary diversity were identified as a major strategy to address malnutrition. The key project objectives were:

- To setup a nutrition vertical under OLM with dedicated human resources & implementation framework work across programme management unit at state, district & block levels
- To build and improve the knowledge and capacity of 9000 community cadres, 250 trainers and staff of OLM around nutrition (positive behaviours and practices) as well as dietary diversity practices to enable them to positively influence 7.5 lakhs SHG households
- To influence household behaviour on nutrition related aspects as covered in the 14 modules delivered through the SHG weekly meetings
- To improve the dietary diversity of 2.5 lakh households through facilitation of HH level implementation of the dietary diversity prototype

2.3. Phases of MUB

The MUB initiative was planned to be implemented in a phased manner through SHGs of OLM with the primary objective of it being self-sustaining. The implementation of this project can be divided into 2 phases commencing from the piloting by Living Farms to scaling up by OLM with three RNGOs in 107 blocks and further up scaling by convergence with MGNREGS in 314 blocks across the state.



Pic 4 – Phase of MUB

2.3.1. Phase 1 - Piloting by Living Farms

The nutrition garden model was developed drawing upon evidences and impacts of various interventions and studies around the globe on malnutrition and dietary diversity. Some of them were "Suuhara" in Nepal which was on multi-sectoral approaches to reduce malnutrition, "Shouhardo" in Bangladesh which was on women empowerment for addressing malnutrition, and Lancet publications on dietary diversity and role of women collectives on birth outcomes. Food and Agriculture Organization (FAO) of the United Nations through its various studies suggests that promoting nutrition gardens and household consumption of its produces led to decrease in Vitamin A deficiency related diseases remarkably. FAO also recommends production diversification, intensive production of nutrient rich crops and small-scale livestock to help in reducing malnutrition. Backyard nutrition garden can promote 44 different types of micro-nutrient rich fruits, vegetables and greens along with poultry and eggs for household consumption. This can cater to 6 food groups' requirements of households and increase the household dietary diversity.

During 2014-2016, backed by evidenced based learning, APF partnered with Living Farms, an RNGO, to mobilize communities in Rayagada and Kalahandi districts of Odisha for establishing individual nutrition gardens in their backyards as a part of the Food and Agro-Ecological Approaches to Reduce Malnutrition (FAARM) project. The components of the project were:

- **Community meetings:** The community meeting approach, which is known as PLA-LANN¹² (Participatory Learning Action – Linking Agriculture and Natural Resources to Nutrition) to improve dietary diversity was one of the key components of the FAARM project. In PLA-LANN, communities are facilitated to analyze their own situation with regard to malnutrition and make decisions on the ways to address it through a series of meetings. This was adopted in the MUB initiative and delivered through SHGs – community platform. The Pilot phase had 17 PLA-LANN modules which was reduced to 14 modules in the MUB initiative the details of which are mentioned later on in this report.
- **Improving dietary diversity:** The second component of the FAARM project was the promotion of nutrition gardens, where a variety of highly nutritive locally available vegetables were grown in a systematic manner in small pieces of land available in households. This was adopted into the dietary diversity prototype and additional components of backyard poultry and goat rearing were included in it.
- **Household level interactions:** The third component was engaging with communities through home visits to ensure that the target groups adopt the recommended Infant and Young Child Feeding (IYCF) practices, take nutritious balanced diets and make sure that the diverse varieties of vegetables grown in their nutrition gardens are consumed. These visits also focused on helping women and children attain their nutrition entitlements through government schemes like ICDS.

An impact evaluation of the FAARM project was carried out by Valid International (Oxford, UK) in 2017 which showed a positive impact on maternal and child dietary diversity in the project areas. This project formed the basis of the current partnership of APF with OLM and aimed to mainstream this model to improve dietary diversity in the state. Since the target group was women and children, the SHG platform was leveraged for programme delivery. OLM’s extensive coverage and reach made it an appropriate platform for scaling up of this intervention in the subsequent phases.

2.3.2. Phase 2 - Scaling up by OLM in Partnership with APF and RNGOs

The scale up plan was to cover 7.5 lakh women in 107 Blocks across 30 districts, based on the malnutrition situation. The primary target audience are members of the SHGs promoted by OLM and their households, especially pregnant women, lactating mothers, adolescent girls and children between 0-5 years of age.

Considering the scale of the intervention, APF proposed to engage 3 more NGO partners namely PRADAN, Harsha Trust and Reliance Foundation due to their vast experience in livelihoods programmes in the target areas, and working with women collectives. The experiences of PRADAN and Harsha Trust in livestock programmes improvised the MUB initiative by adding BYP and thus incorporating animal protein in the diet of the target group. In order to put together a proper delivery strategy, in addition to the projects which were referenced in the Pilot phase, the models of BRLP in Bihar, Reliance

¹² The PLA concept in Odisha was initially introduced by the state government in its Odisha Health Sector and Nutrition Support Programme (OHNSP). It was used to address the maternal, child health and sanitation programmes of the state by leveraging the reach of Mission Shakti women’s SHGs. Living Farms adapted PLA to include the LANN component (Linking Agriculture with Natural Resource and Nutrition) in its FAARM project.

Foundation’s Rural Transformation Programme in Bolangir district of Odisha, along with the Living Farms’ experience of working with SHGs on nutrition gardens in Rayagada and Kalahandi districts of Odisha were studied and learnings were consolidated and incorporated.

In order to address under-nutrition in the state, APF and OLM focused on two main goals.

- To improve dietary diversity, nutrition knowledge & practices of women across Odisha
- Build capacity of OLM field level cadres on nutrition issues for better service delivery

2.3.3. Components of MUB in Phase-2

MUB has three components – PLA-LANN, nutrition garden, and livestock development. As per standard process PLA-LANN needs to be rolled out first, followed by nutrition garden and livestock development. The fundamental idea of rolling out PLA-LANN first was to facilitate the communities to analyze their own situation and make decisions.

a. Component 1: PLA-LANN: Modules of 14 Weeks

PLA-LANN is the component which makes the community carry out the root cause analysis of issues, prioritize issues and prepare a community level action plan to address such issues. It has four phases which start with identifying and prioritizing problems, leading to the phase in which solutions are planned, which further lead to implementing the solutions, and ends with evaluation. Community Resource Person- Community Mobilization (CRP-CM) of OLM were trained on how to conduct PLA-LANN meetings at SHGs level and they implement it through 14 weekly meetings of SHGs. These 14 modules were designed to be completed in 14 sessions.

Table 3 - PLA-LANN Modules		
Phases	Meeting No.	Modules
Identifying and prioritizing problems	1	Introduction to the 14 PLA module, Understanding the intergenerational malnutrition cycle
	2	Mapping of current status of undernutrition (significance of weight measurement and MUAC measurement and uses of growth chart)
	3	Identifying and prioritizing HNWASH related problems
	4	Finding causes and solutions to the problems
Planning Solutions	5	Choosing feasible strategies and taking over responsibilities
	6	Importance of One thousand days care
Implementing Solutions	7	Locally available food and balanced diet
	8	Newborn care and exclusive breastfeeding
	9	Timely initiation of complementary feeding and Improved IYCF practices
	10	Unsafe food- Food contamination through pesticides
	11	Understanding fecal oral transmission routes
	12	Importance of cleanliness during monthly periods of adolescent girls, in taking iron & Folic acid tablets and stop early marriage (below 18)

Table 3 - PLA-LANN Modules		
Phases	Meeting No.	Modules
	13	Review of strategies to prevent under nutrition in communities
Evaluation	14	Evaluation

b. Component 2: Nutrition Garden

A nutrition garden is developed in a systematic manner in a small patch of land (usually in the backyards of homes) in which beds were prepared in specific formats (*as shown in the Pic. 4*) and selected nutrition-rich diverse vegetables and fruit trees were grown organically with specific attention to addressing micronutrient deficiencies (Vitamin A, Iron, etc.) of the households.

The objectives of Backyard Nutrition Garden were to:

- Improve access of households to nutrition-rich, diversified foods while keeping in mind particular the needs of pregnant women, lactating mothers, children and adolescent girls in a family
- Promote healthy food habits by making diverse foods available at household level and providing nutrition and dietary education to community

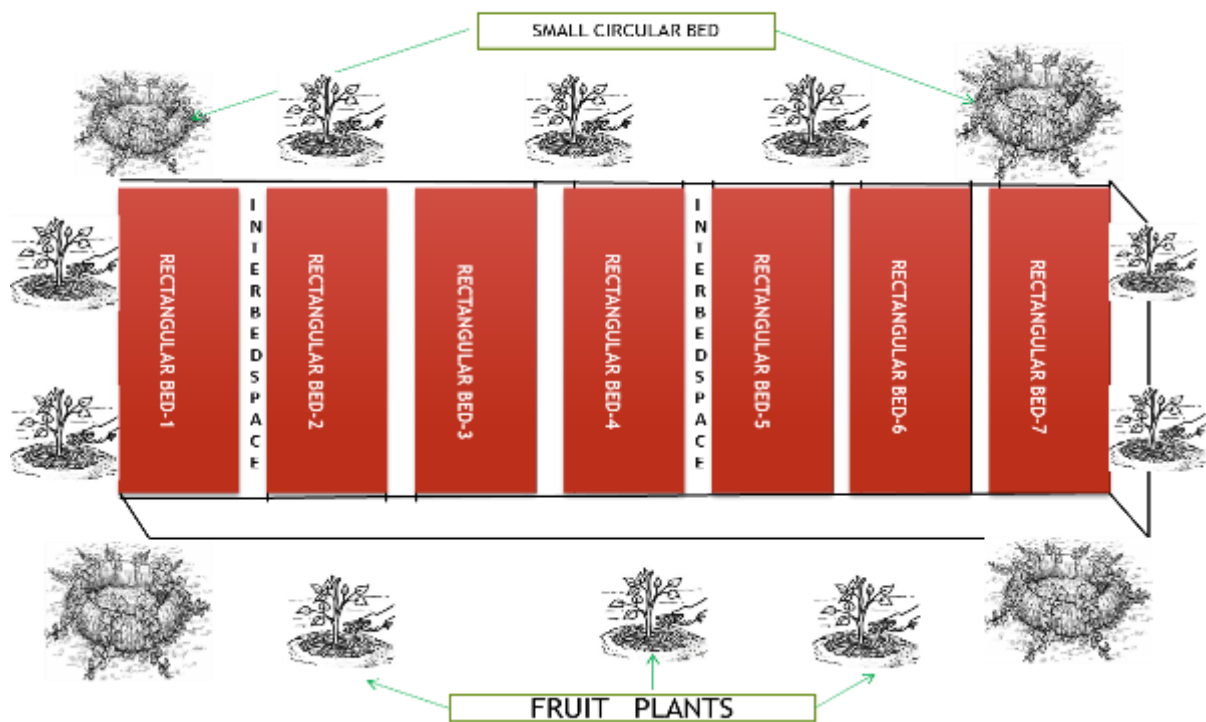
Usually, three types of nutrition gardens models such as rectangular model, circular model and bag model were adopted to be developed in the backyard of the house (*depicted in the Pic. 5*). The first two models were developed considering the size of the land that the household had. In case of landless households, the nutrition garden was developed by growing vegetables in gunny bags filled with soil and manure.



Pic 5 – Types of Nutrition Garden Models

Rectangular Model: A typical rectangular model nutrition garden consists of a minimum of 7 raised beds, 4 small circular beds and 10 horticultural plants (usually papaya, banana, drumstick, lemon) around (Refer pic 6). In some situations, length and width of nutrition gardens may be changed depending on the area available and the size of the plot. Length may vary from 10 to 20 feet while width may vary from 3 to 4 feet.

Rectangular Model



Pic 6 – Rectangular Model of Nutrition Garden

The specifications for a typical rectangular model of a nutrition garden are as below.

Particulars	Length (ft.)	Breadth (ft.)	Area of each unit (Sq. Ft.)	No. of units	Total area (Sq. Ft.)
Raised bed	20	3	60	7	420
Water channel along length of raised bed	20	1	20	8	160
Water channel along width of raised bed	3	1	3	14	42
Circle bed	1 meter (3.3 ft.) diameter		8.5	4	34
Space for Horticultural plantation	10 no. of plants				150
Walking space					65
Total area for vegetable cultivation and horticultural plantation					871 Sq. ft.

The typical area requirements for nutrition gardens based on the experience of Living Farms’s FAARM is mentioned in Box 3. The typical output from a nutrition garden of 2 decimals is 1-1.2 kg vegetables per day.

Box 3 - Land requirements for developing nutrition gardens for households with different family sizes

- 1 decimal model (435.6 Sq. ft. area): For a family of 2 adults and one child
- 2 decimal model (871.2 Sq. ft. area): For a family of 3 adults and 2 children
- 3 decimal model (1306.8 Sq. ft. area): For a family of 4 adults and 3 children

4 decimal model (1742.4 Sq. ft. area): For a family of 5 adults and 4 children
5 decimal model (2178.0 Sq. ft. area): For a family of 6 adults and 5 children

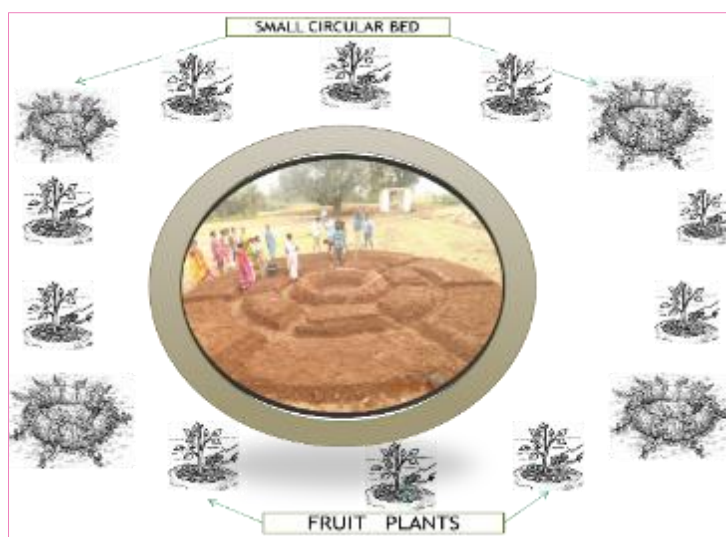


Pic 7 – Rectangular Nutrition Garden Bed Preparation



Pic 8 – A Completed Rectangular Nutrition Garden in Ganjam District

Circular Model: A typical circular model nutrition garden consists of an inner middle circle, 14 small beds, 4 small circular beds and 10 horticultural plants around (Refer pic 9). The inner middle circle can be used as a compost pit where kitchen scraps, leaves and weeds can be put.



Pic 9 – Typical Circular Nutrition Garden Model

Particulars	Radius (ft.)	Area of each unit (Sq. Ft.)	No. of units	Total area
Big Circle bed	15	706	1	706
Circle bed	3.3 ft.	8.5	4	34
Space for Horticultural plantation and walking path	10 no. of plants			131 (4 papaya plants are planted on the bund at the circumference of the circle in the centre)
Total area for vegetable cultivation and horticultural plantation				871 Sq. ft.



Pic 10 – A circular nutrition garden model with measurements

Bag Model: For the landless families, an innovative concept of growing multiple creeper vegetables

in gunny bags was promoted to fulfill the daily nutritional requirements. This involved growing creepers in gunny bags (cement or fertilizer bags) where plants can be grown with very little space. A typical bag model nutrition garden consists of a minimum of 15 sacks or gunny bags (refer Pic-11).



Pic 11 – Bag Model of nutrition garden

Crop Plan for Nutrition Gardens: Crop planning was developed considering the nutrition requirements of the target groups (Box 4). This was based on the publication by FAO - *“Minimum Dietary Diversity for Women: A Guide to Measurement.”*¹³. The crop plan usually includes:

- a) Dark green leafy vegetables like Amaranthus, *kalam saag*, and spinach
- b) Vitamin A-rich fruits and vegetables like pumpkin and papaya
- c) Other vegetables like brinjal, chilli, cowpea, gourds, okra, tomato
- d) Other fruits like lemon.

Box 4- 10 food groups for dietary diversity

- Grains
- Roots and tubers
- Pulses
- Nuts and seeds
- Dairy products
- Poultry and fish
- Dark green leafy vegetables
- Vit-A rich fruits and vegetables
- Other vegetables
- Other fruits

(Source: FAO)

As part of MUB, OLM provided seed kits to each of the households. A typical seed kit consists of seeds of brinjal, chilli, pumpkin, ridge gourd, bottle gourd, cucumber, snake gourd, cow pea, *basella (Poi)*, okra, *kalama*, amaranthus, and ivy gourd (*Kundru*). Saplings of drumstick, papaya, lemon and banana were also provided.

Capacity Building of Krishi Mitras (KMs)¹⁴: KMs were trained on various topics like different nutrition garden models, design layout of models, crop matrix and crop calendar, organic manure and pesticide

¹³ <http://www.fao.org/3/i5486e/i5486e.pdf>

¹⁴ A Krishi Mitra is a community cadre of OLM who works with farming households to promote sustainable agriculture

preparation and application, water management, seed collection and preservation etc. This trained cadre demonstrated the process of preparation of nutrition gardens and provided handholding support to the MUB farmers as and when required. One KM was mapped to provide services to about 150 households.

Household selection criteria for nutrition garden: The primary target audience consisted of the members of SHGs promoted by OLM and their households and preference in selection was given to households with pregnant women, lactating mothers, children below five years and adolescent girls from Poor, Extremely Poor & Vulnerable Group (EPVG) and other vulnerable groups like Particularly Tribal Vulnerable Groups (PVTGs), Scheduled Castes (SCs), Scheduled Tribes (STs), etc.

Other elements of Nutrition Garden: As part of the nutrition garden component, multiple interventions like soil fertility management (eg. green manure, compost, liquid manure etc.), seed treatment (by using Cow urine), community nursery raising (preparation of beds, raising seedlings), water management (mulching, pitcher irrigation), pest and disease management, seed conservation, establishment of community based seed banks etc. were undertaken.

Box 5- Some of the Key Interventions under Nutrition Garden Component		
<p>Seed Bank: Seed bank is a collective initiative where, the seeds produced locally are identified, collected and conserved by the communities themselves and shared among its members and even, with members of other communities, subsequently. In seed banks, seeds (in this case, vegetable seeds) are conserved during each season, that is, during Kharif, Rabi and Summer separately, and used next year, during the same season. Considering the importance of seed bank, it was promoted at various places.</p>	<p>Seed Conservation: Seed conservation at local /individual level traditionally requires less care and management and not technology-dependent. It reduces farmers’ dependency upon the market, saves expenditure, promotes seed sovereignty and builds capacities and self-confidence of farmers to manage their own land and agriculture. During implementation of nutrition garden initiative different indigenous methods of seed conservation were adopted at numerous places.</p>	<p>Community Nursery: Community nursery is defined as a nursery raised in a single place at community level; that is in village or GP levels, by a group of individuals to raise vegetable and fruit bearing seedlings for the requirement of the local households/farmers. Under nutrition garden component, members of some selected SHG collectively developed community nurseries at their local level in order to meet the requirement of their own as well as neighboring villages.</p>



Pic 12 – Germination test of Seed Kit

Component 3 – Livestock Management

Livestock management was included as a component of the MUB initiative considering the importance of animal protein in dietary diversity, their significance in a balanced diet and increasing the diversity of income sources for households. Backyard poultry and goat rearing is practiced by the rural households, especially by tribal communities for providing nutrition and subsidiary income. They do not require much investment and are a part of the socio-cultural environment in rural areas. Goats and BYPs are often called ATMs as they can be sold easily to fulfill economic needs. For example, a backyard poultry unit consisting of 5 hens and one rooster is sufficient to provide the animal protein requirements of a regular 5–6-member family. In case of a larger flock size, it can also help provide additional income to the beneficiary families. As per OLM data, the average family income is Rs 15-20,000/- approximately from livestock and it constitutes a significant part of their net annual income. With this thought livestock management was included in this phase of the project as one of the key components.

Capacity Building of Prani Mitras (PM)¹⁵ - As part of the livestock component of MUB, two PMs per Gram Panchayat were jointly identified by the community members and OLM and deputed at Village Organization (VO)/Gram Panchayat Level Federation (GPLF) level. PMs are one of the community cadres under OLM who were trained to provide necessary support for vaccinations, deworming, feed preparation, ethno-veterinary medicines, low cost shed preparation and manure preparation. After receiving trainings, they started operating in close coordination with the staff of the Department of Animal Husbandry, Govt. of Odisha. One PM was mapped to provide services to about 150 to 200 families in 5 contiguous villages (approximately 30 families per village). In addition, one assistant (women were preferred for this role) per village was identified and trained to assist the PM. One block level entrepreneur was identified to supply inputs like seeds, compost, etc. to the PM.

2.3.4. Scaling up of MUB in convergence with MGNREGS

In 2020, the Govt. of Odisha decided to scale up the MUB initiative to 500,000 households and converge it with MGNREGS. With the onset of Covid-19 came lockdowns and severe restrictions on

¹⁵ A Prani Mitra is a community cadre of OLM who works with households to promote sustainable livestock management

the movement of people and goods. However, MUB initiative adopters were able to get fresh organic vegetables for themselves and also for their communities. In addition to the existing components, the following modifications were done under the project to have more systematic strategies to achieve the desired result.

- **Special Fund Allocation**- The state cabinet allocated INR 500 crores from MGNREGS fund to promote 5 lakh nutrition gardens across the state. Convergence with MGNREGS facilitated creation of individual assets for vulnerable households.
- **Scaling up of the project across all 314 blocks in Odisha** - The earlier plan was to restrict MUB to 107 blocks but when the government decided to converge it with MGNREGS for addressing the issue of returnee migrants, this was expanded to all districts of Odisha to establish 500,000 nutrition gardens in all 314 blocks of Odisha in FY 2020-21.
- **Nutrition garden models:** Rectangular model and circular model were mostly promoted after convergence with MGNREGS. In each model 10 to 17 types of vegetable saplings were planted as per the specific design mentioned in 2 decimals of land.
- **Additional components** - The project was modified to add green fencing for protection of the nutrition garden, water tanks for better water conservation, protective irrigation and management, and compost pits for producing organic manure, to the existing nutrition gardens.
- **Household selection criteria** – Post the MGNREGS convergence, the household selection criteria were changed. Works related to individual assets were prioritized for households having land. Other criteria like households belonging to SC, ST, nomadic tribes, de-notified tribes, BPL families, women-headed households, physically handicapped headed households, remained unchanged. Modality of selecting eligible households were as follows:
 - I. The KMs of respective GPLF were to prepare the list of eligible households in consultation with CLF & GPLF members and Gram Rozgar Sewak (GRS¹⁶) as per the eligibility criteria.
 - II. The list needed to be approved by Palli Sabha¹⁷ / Gram Sabha¹⁸ to be included in the annual action plan of MGNREGS.
 - III. The KMs and MBKs of respective GPLFs were to support GRS and Gram panchayat for smooth planning, execution and completion of works in time.

¹⁶ A Gram Rozgar Sewak (GRS) is recruited by the State Govt. through the Block Development Officer (BDO) to implement MGNREGS in every Panchayat. The role of a GRS is to support the technical person in strengthening MGNREGS works.

¹⁷ Palli Sabha – For every village within the Gram Panchayat, a Palli Sabha is constituted by the state govt. It recommends to the Gram Panchayat about development works to be undertaken along with budget estimates.

¹⁸ Gram Sabha is the primary body of the Panchayati Raj system and is elected directly by the electorate.

Box 6- Key Features of MGNREGS Convergence Approach:

- It was decided that participants working on nutrition gardens under MGNREGS will get paid for 33 person days towards labour and materials for nutrition garden preparation.
- The cost of eight saplings (3 papaya, 3 drumstick and 2 lemon) was covered by MGNREGS. The total estimated cost was INR 10,479/- in 294 blocks @ INR 207 per person day for non-migration districts (Cost of labour @INR 6822 and cost of material @INR 3658). For the remaining 20 blocks (identified as migration prone areas) of 4 districts (Bolangir, Nuapada, Kalahandi and Bargarh), the estimated cost was INR 13,508/- @ INR 298 per person day.
- As part of the OLM component, each beneficiary of MUB under MGNREGS was to get 2 banana saplings and seed kits of (10 to 17 types) for three seasons (Kharif, Rabi and Summer) to establish nutrition gardens. The value of these saplings and seed kit was INR 250/- each. Hence the total allocation (including MGNREGS component) for 294 non-migration blocks came to INR 10,729/- and INR 13,758/- for 20 migration blocks of 4 districts.

2.4. Role of Key Partners and Stakeholders

The stakeholders in the MUB initiative are:

Table 4 – Roles of key stakeholders		
Sl. No	Partners	Roles Undertaken
1.	APF	<ul style="list-style-type: none"> ● Conceptualization and design of the programme. ● Establishment of nutrition vertical and recruitment of staff jointly with OLM for roll out of the programme. ● Funding support to 3 RNGOs to provide technical support to OLM. ● Funding support to OLM for programme implementation ● Advocacy for convergence. ● Engage technical agency to develop an additional module and integrate into the existing MIS of OLM to track and monitor the programme ● Engage technical agency to set up technology based societal platforms to strengthen the technical capacity of OLM cadres using digital learning methods ● Joint state level reviews and field monitoring visits with OLM to review project implementation ● Engage credible agencies for third party evaluation
2.	OLM Nutrition Team	<ul style="list-style-type: none"> ● Manage partnership with APF and Resource NGOs (PRADAN, Living farm, Harsha Trust) ● Create and share different SoPs and Manuals for implementation of MUB ● Develop & execute capacity building strategy of MUB for 3 components (NGs, PLA LANN and Livestock) ● Track / Monitor use of APPI grant, OLM Annual action plan (NRLM & NRETP) and other support (OMBADC) for MUB program implementation

Table 4 – Roles of key stakeholders		
Sl. No	Partners	Roles Undertaken
		<ul style="list-style-type: none"> ● Executing MUB with help of state, district and block team and other stakeholders ● Design and implement convergence strategy with MGNREGS, WCD and Mission Sakti and other departments like FARD, Agriculture etc. ● Collect data for analysis and report development. ● Periodic report submission to APF, MoRD for NRLM and NRETP, OMBADC and PR & DW department ● Support various evaluation, impact study and best practice documentation and MIS execution
3.	Resource NGOs (Living Farms, PRADAN and Harsha Trust)	<ul style="list-style-type: none"> ● Prototype development, related manuals and other technical resources for nutrition garden and livestock development ● Development of 14 modules of PLA LANN and related IEC materials for community cadres ● Placement of BLRPs to provide technical inputs and support and quality assurance to the OLM field team ● Provide need-based support to OLM field teams where BLRPs are not present <p>Capacity building and quality monitoring of technical inputs</p>
4.	OLM and its community platform (SHG, CLF and GPLF)	<ul style="list-style-type: none"> ● Core community cadres - Krishi Mitra, Prani Mitra and Community Resource Persons [Community Mobilization (CRP-CM), Master Book Keeper (MBK), Bank Mitra] deployed at GPLF were trained by RNGOs and MTs, and they further trained SHG members and beneficiaries to establish nutrition gardens, poultry and goat rearing. ● Subsidiary cadres - Poshan Sakhi (nutrition CRP), Financial literacy (FL-CRP), Local Resource Group (PRI-CBO convergence) and External Livelihoods Support Person (ELSP)
5.	Master Trainers	<ul style="list-style-type: none"> ● Get Training of Trainers (ToT) on Nutrition Gardens, PLA LANN 14 modules, Livestock (BYP and Goat) ● Trained community cadres (CRP CMs, Krishi Mitra, Prani mitra and other community cadres) on Nutrition Gardens, PLA LANN 14 modules, Livestock (BYP and Goat) ● Work under the guidance of the District Project Manager to design and implement different training programme as per Manual, SoPs and training materials ● Demonstrate different models of nutrition gardens as a part of training to community cadres ● Provide orientation training to Sarpanch and other elected representatives, GPLF and CLF leaders/ members as per capacity building plan

In addition to the stakeholders mentioned above, the line departments of the state government which had important roles in the programme included the Directorate of Horticulture, the Directorate of Fisheries & Animal Resources, Panchayati Raj and Drinking Water Department, WCD Department, among others.

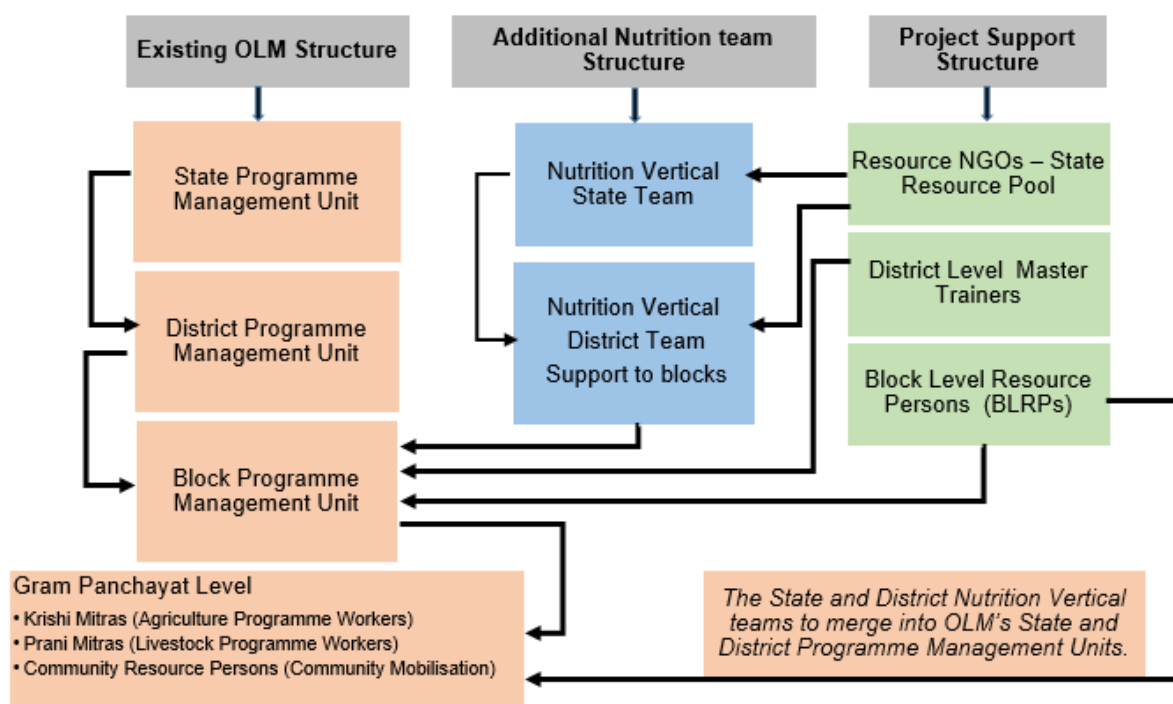
2.5. Project Implementation Strategy

The MUB implementation strategy consisted of 4 parts.

- Establish and capacitate the nutrition vertical in OLM.
- Capacity building of 9000 OLM community cadres on nutrition issues through cascade mode of training.
- Implementation of the three initiatives – PLA LANN, Nutrition gardens, backyard poultry and goat rearing at the target household level with support of RNGOs.
- Educating the women SHG members on nutrition to make the entire process self-sustaining.

2.6. Implementation Structure:

A systematic organic structure was developed for implementation of nutrition garden initiative in the state. Effort was made to fit this structure at all three levels such as a) the existing OLM structure, b) establishing additional nutritional vertical and c) project support structure at RNGO level. The figure below gives an overview of this implementation structure and the linkages established between different levels.



Pic 13 – Implementation structure of MUB

2.6.1. Setting up the Nutrition Vertical in OLM

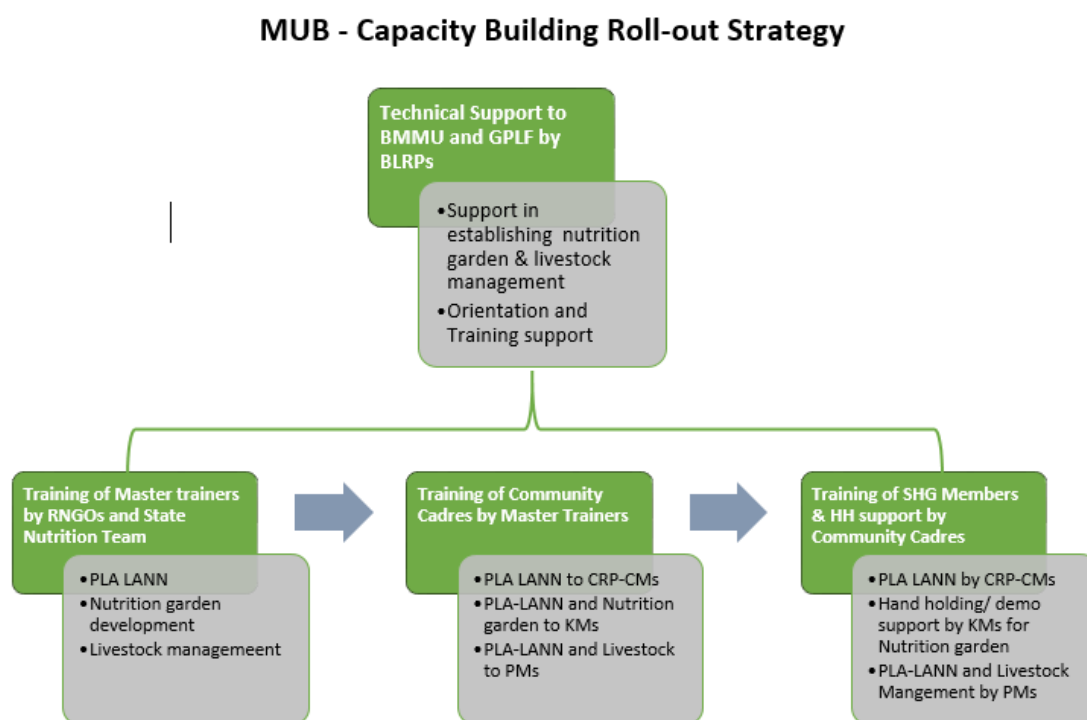
The initiative also mandated the creation of a nutrition vertical with OLM with the provision of hiring 97 project personnel both at the state and district levels. At the state level, seven staff members were hired as a part of the new nutrition vertical under OLM. Recruitment of these 90 staff at district are still pending, which is a major constraint of this programme sustainability as each district was to have one District Project Coordinator (DPC) and two Block Project Coordinators (BPCs). The role of the DPC was to supervise and ensure coordination with verticals, convergence across departments, and

monitoring of the MIS. The BPCs supervise activities at the community level, in the blocks assigned to them.

Levels	Role and Responsibilities
State	<ul style="list-style-type: none"> ● Manage partnership with APF and Resource NGOs (PRADAN, Living Farms, Harsha Trust) ● Create different SoPs and manuals for implementation of MUB ● Develop and execute capacity building strategy of MUB ● Monitor use of APF grant, OLM annual action plan (NRLM & NRETP) and provide other support [Odisha Mineral Bearing Areas Development Corporation (OMBADC)] for MUB initiative implementation ● Executing MUB with help of state, district and block teams of OLM and other stakeholders ● Design and implement convergence strategy with MGNREGS, WCD and Mission Shakti and other departments ● Support project impact study and best practices documentation along with MIS execution
District	<ul style="list-style-type: none"> ● Identify Master Trainers and assist them in attending the ToT, organized by the state team ● Supervise/ support in distribution of various training materials to intended community cadres, CLF and other stakeholders ● Design and execute various training programmes and demonstration for community cadres and other stakeholders with help of Master Trainers or BLRPs (if required) on NGs, Livestock and PLA-LANN in coordination with the PM - state capacity building. ● Compile collected data from different blocks for submission to the state team as per MIS format or generate special report ● Transfer programme funds to GPLF for programme execution (Seed procurement, conducting training etc.) as per annual action plan of OLM ● Monitor quality and quantity of programme on sample basis and give feedback to the block team and share issues and challenges with the State team ● Design and execute need-based support to RNGOs for specific blocks of districts funded by APF
Block	<ul style="list-style-type: none"> ● Conduct various trainings for community cadres with the help of Master Trainers or BRLPs ● Monitor field activities like SHG meetings, conducting PLA-LANN, demonstrations of NGs, livestock activities (Vaccination, deworming BYP and goats), additional feed preparation for BYP and goats ● Collection of data on progress of various components of MUB with the help of MBK and other cadres and share the same with the district level team ● Cross verify / check few programme activities on sample basis ● Monitor timely beneficiary selection, demonstration of NGs and livestock activities, seed procurement, bed preparation, and various trainings of cadres

2.6.2. Capacity Building of OLM Community Cadres

The existing community cadres were tapped to implement the project from the perspective of better utilization of resources. They were required to be trained in the concepts of the MUB and thus RNGOs developed training modules and the content of Information, Education and Communication (IEC) materials with the guidance and review support of state nutrition team for using them at all levels of the training in a cascade mode. These training modules and IEC materials were developed mainly on the topics of PLA-LANN, nutrition garden and livestock development.



Pic 14 – MUB capacity building roll-out strategy

The state nutrition team with the support of RNGOs imparted Training of Trainers programme to Master Trainers on different project components related to PLA-LANN, nutrition garden promotion and livestock management. Then the Master Trainers with technical support of BLRPs/RNGO experts capacitated the CRP-CMs, KMs and PMs on PLA-LANN, nutrition garden promotion and livestock management respectively. KMs conducted training and demonstration activities with SHG members on nutrition gardens initially in their own lands to motivate others, CRP-CMs conducted PLA-LANN meetings, and PMs provided support on BYP and goat rearing.

2.6.3. Implementation Modality Based on Type of Engagement of RNGOs

107 blocks (43 Direct Support blocks and 64 Need-Based Support blocks) across the state were identified for implementation of MUB based on malnutrition status, availability of OLM community cadres, presence of OLM’s ‘Centers of Excellence’¹⁹, with farmers producers’ groups and Common

¹⁹ A Center of Excellence (COE) is a training-cum-capacity enhancement Center by OLM for new areas and people at the GPLF level.

Facility Centers²⁰ for OLM's livelihoods interventions.

There were two types of blocks based on support by RNGOs –

- a) **Direct Support Approach:** In direct support blocks, all blocks were selected for implementation. In these districts, each block had a BLRP to facilitate training, demonstrations, handholding support, and support with seeds and sapling procurement etc. to the community cadres.
- b) **Need based Support Approach-** In need-based support blocks, implementation was done in all blocks with the support of RNGOs in terms of training, demonstrations, and handholding support for any of the project activities to districts as per their demand. In the need-based blocks, the RNGO staff provide support for three days per month per block.

2.6.4. Intervention at the SHG Level

Among these 7.5 lakh targeted SHG members, the 'priority' households (those that had pregnant or lactating women, children up to six years of age, or adolescent girls) were identified for more intensive and targeted support. SHG members were mobilized to attend PLA-LANN meetings where specific nutrition-related topics were discussed at least once in a month. SHG members, those who belong to 'priority' households, were supported to undertake nutrition gardens and BYP or goat rearing activities. These 'priority' households received financial assistance for seeds, saplings, etc. Other SHG members were also supported if they had interest and requested for support in adopting these practices.

2.7. Current Monitoring Mechanism and MIS of the Project

Monitoring of the project activities takes place periodically in a regular manner at different levels. The monitoring system of MUB from the ground level to state level is mainly paper-based. However, the monitoring data collected from the ground gets converted into Google Sheets at the district level to track the progress and are updated periodically to meet the reporting requirements of senior management and donor (*Refer Annexure 4*). In addition, Open Data Kit (ODK) app data and photo capturing of nutrition gardens have been done two times (September 2019 and January 2021) to monitor progress. Minimum Dietary Diversity (MDD) surveys have been conducted two times (February 2020 and February 2021) to capture access to 10 food groups by target beneficiaries.

The following steps are followed to capture data on physical progress and trainings and generate the MIS (paper based) for the MUB initiative.

- a. The data is collected monthly in the prescribed format by the community cadres. This includes the family profile of beneficiaries, inputs received, and the status of implementation of PLA-LANN, nutrition gardens and livestock. The CRP-CMs, KMs and PMs of the respective GPs are responsible to collect progress details in the prescribed format and submit it to MBK who consolidates the data under the guidance of the block team.
- b. Master Book Keepers (MBKs) at the GPLF level are responsible for consolidating the data in the prescribed format developed by OLM and submit the same to the BMMU.

²⁰ Common Facility Centers are initiatives of OLM for universalizing farm machinery, plugging the gaps in livestock care and disseminating knowledge on technology adoption.

- c. At the block level, the block MIS person leads the MIS team, and is responsible for validation and consolidation of reports in the prescribed format and submission to the DMMU.
- d. The block MIS person is responsible to make sample checks covering at least 10% of the data and thereafter the BPM of the respective block is supposed to do a 3% sample check before submitting the final version of the data set to the DMMU.
- e. The district MIS nodal person of DMMU is responsible for preparing the consolidated report for the district in a prescribed Google format and submit online by the 5th of every month. The consolidated district wise Google sheets are associable to the state team. The MIS & MLE manager at the state level extracts the district level data from that Google sheet and prepares the compiled report for the state.

The capacity building of various stakeholders (Community cadres, BMMU officials, DMMU officials, GPLF members, etc.) for data collection as per MIS requirements as part of the programme was organized at District/Block levels.

In addition to the above-mentioned monitoring mechanism, other platforms and occasions are also used for monitoring of the project activities and consolidating learning outcomes. These platforms and occasions are:

- Tracking of learning outcomes during the training of community cadres conducted by BMMUs, BLRPs and Master Trainers. As the trainings happens in a cascade mode, at each level, learning outcomes are assessed by pre-training and post-training assessments. Clarifications are provided at the end of the assessment. For example, RNGOs conduct trainings for the master trainers on PLA-LANN, nutrition garden, and livestock development. The sessions on nutrition gardens and livestock development are more of live demonstrations. But for PLA-LANN, pre and post training assessments are done for the master trainers. The same process was followed downstream when the master trainers/BLRPs trained the community cadres. At the community level, the monitoring is comparatively weak primarily due to lack of adequate staff.
- Time to time handholding supports are provided by BLRPs and BMMU team to the community cadres to carry out project activities in their respective areas in direct support district. So, considering the number of villages in a block, BLRPs and BMMU team visit the villages once in every two months in the direct support districts to monitor the progress and provide supportive supervision to the community cadres. However, in case of immediate requirements, the BLRPs and BPMU team are always available to provide support to the community cadres.
- BMMU team along with RNGO experts monitor the work of the community cadres in need-based support districts too. RNGO experts provide 3 days of support per month to a block but this is subject to the requirements raised by the district team.
- Monitoring by DMMU and SMMU Nutrition Teams – The DMMU and SMMU nutrition teams monitor the activities carried out by both direct support districts and need based support districts through regular field visits.
- Monthly review meetings, six-monthly reflection, learning and change (RLC) visits by APF, OLM and RNGOs are held every six months. The main idea behind this step is to analyze the programme and its direction regularly so that issues could be resolved and direction changes could be made if required.

- Oxford Policy Management (OPM) has been roped in for external evaluation of the project in every six months. As of now, one such round of evaluation has been carried out. However, further evaluations were discontinued due to the COVID-19 pandemic.

3.1. Key Achievements Under MUB initiative

The MUB initiative was conceptualized to achieve very specific purposes of improving nutrition status of pregnant women, lactating mothers, children below 5 years and adolescent girls through promoting dietary diversity practices among them. While this was the main objective, additional supporting objectives were built in to develop the programme structure and delivery. The project commenced in 2018-2019 and in the past 2 years or so, there is considerable progress in spite of the effects of COVID-19 pandemic. From a best practice perspective, one of the major achievements has been the effective planning and implementation process of the project. Though implementation was not entirely flawless, support from technical experts helped the programme to move forward and cover a large section of the target group.

The MUB initiative is currently in progress and is being implemented in a phased manner. The impact of the project hence varies in different areas due to the difference in phases. Through this document, an attempt is made to capture changes attributable to project interventions.

Overall, since its introduction in 2019, MUB has been able to reach all 30 districts of the state and helped the target groups establish nutrition garden, and practice BYP and/or goat rearing through a strong convergence between different stakeholders. It also further enhanced the knowledge and practices dietary diversity among target groups. The major achievements of the project are detailed below:

Box 7 - Major MUB Achievements

- **Awards and recognition** - OLM won the Outlook Poshan Award 2019, in the category of Safe and Nutritious Food for making a substantial impact in the field of nutrition. MUB has been featured as a success story in NITI Aayog's report titled 'Health & Nutrition Practice Insights'. The report praises the schemes, highlighting how it brought real change at the grassroots.
- **Implementation at scale and enhanced capacity of community cadres and SHG women**
 - 4,70,000 women SHG members were trained on PLA – LANN, nutrition gardens and livestock development.
 - 424,000 nutrition gardens were established, which has contributed towards HH dietary diversity.
 - 11,074 community cadres were trained to deliver the MUB initiative across the state.
- **Wider replication and adaptation of the project** - The project led to the development of a nationally replicable model for increased and diversified household food production and consumption by rural families, in combination with nutrition education. The MUB initiative has already been adopted by other states like Jharkhand and Maharashtra.
- **Establishment of dedicated nutrition vertical** - A dedicated nutrition vertical was established as part of OLM which helped in a focused approach to MUB implementation. The creation of the nutrition cell is significant as it was able to sharpen the focus solely on nutrition, which in turn helped the MUB programme MUB initiative.
- **Multi-stakeholder/sectoral convergence** - MUB promoted convergence between state departments and various schemes, RNGOs, and funding agencies.

- **Behavioural changes on improved consumption strengthening dietary diversity** - MUB enabled a change in the community knowledge and behaviour towards nutrition. Community members were able to understand the importance of investing in good dietary habits and being self-sufficient in the production of vegetables for family consumption.
- **Funds mobilization** - The Govt. of Odisha identified MUB as an important intervention to help migrant returnees mitigate the impact of COVID and improve livelihood. MUB was converged with MGNREGS and an amount of INR 500 crores was sanctioned.
- **Development of community-friendly ICE and training materials** - 16 training modules and IEC material were developed both in English and Odia. English training material was developed specially to meet the requirements of practitioners from other states.
- **Integration of Nutritional Programme with Livelihood Domain of OLM Across the State** - The MUB initiative ensued a change in OLM's approach, from on-farm/off-farm income generation activities alone to interventions for income generation along with nutrition sensitivity.

3.2. Impact of the MUB initiative

Impact of the MUB initiative can be observed at various levels starting from OLM as an organization level to community, household and individual level in terms of bringing structural and policy level changes within the government departments, enhancing knowledge, changing attitude, behaviour and practices of target groups towards improving nutritional status in the state. The major noticeable impacts of the project are:

3.2.1. Change in Community Knowledge and Behaviour on Nutrition and Dietary Diversity

During the meetings with various stakeholders of the project and FGDs with target SHG members conducted as part of this documentation process, it was observed that participants were well aware about the malnutrition cycle, importance of balanced diet and IYCF practices. Following are some of the key areas on which changes have been observed in terms of community's knowledge and behaviour on nutrition and dietary diversity.

Nutrition Knowledge – Exposure to nutrition education in observation of VHNDs, PLA-LANN meetings and demonstrations of a large number and different varieties of foods during *Pushti Mahotsav*, helped increase women's knowledge on nutrition. It also increased awareness on food and nutrition of other community members, especially children. In FGDs, some women mentioned about the *Tiranga* (tri-color) diet which can boost their health and nutrition. All SHG women may not be able to talk about the nutritional benefits of all food groups but they were certainly well aware about the importance of including different types of fruits, vegetables and livestock in their diets.

Quality of Diet – The women included in the FGDs stated that the quality of their food has improved due to availability of organically grown, fresh vegetables. MUB has helped in modifying food consumption patterns as they grew 13 to 17 types of vegetables and fruits in their own backyards. Demonstrations of cooking by BLRPs and community cadres has helped women know more about preparation of varieties of dishes involving new vegetables like red leafy vegetables (Lal Sag). Some young women also used YouTube on their smartphones to learn the new recipes.

Food Taboos – There is a change in women's perspective with regard to food related taboos. Women included in FGD in Tungurbahal village of Keonjhar district said that earlier they used to avoid certain

foods like papaya, eggs, leafy vegetables, some types of lentils, etc. as it was believed that these foods were harmful for pregnant women. Post-delivery also, women were given limited diets consisting of just rice, garlic, salt, *daal* water, etc. The knowledge acquired through the VHNDs and the MUB initiative has helped them to overcome such beliefs and they have been consequently benefited by a wider choice of nutritional sources. However, in certain areas, food taboos still exist, especially for pregnant women. For example, in Pandrakhal village of Rayagada district, some SHG women stated that foods like prawns, mushrooms, sweet potato (*kandamula*), *arisha pitha* (a locally made cake), etc. are not good for pregnant women as it may cause scalp infection in babies.

3.2.2. Increased Dietary Diversity in the Household

Limited income reduces the ability of households to spend on quality food items and results in a negative nutrition outcome. Producing at the household level for self-consumption increases availability and intake of quality food which includes fresh vegetables, fruits, eggs, and meat. As part of the MUB initiative, 4.24 lakh nutrition gardens have been established across the state, which has played a vital role in contributing to dietary diversity and the food and nutrition security of the target rural households. As reported by the women farmers, because of MUB, they are able to consume at least 2-3 additional food groups. The average consumption earlier in households was around 3-4 food groups which increased to 5-6 food groups because of the MUB initiative. The FGD participants in Khankarpur village in Ballikuda block of Jagatsinghpur district mentioned, “We never cultivated kalam saag (a locally grown greens) earlier. We used to get very little kalam saag from ponds occasionally. As kalam seeds were provided as part of MUB, we are able to cultivate it as and when required. We also get to grow off-season vegetables. We did not eat many varieties of food earlier but since we now grow them, we are able to consume a much wider variety of vegetables”. Similarly, Sanju Palka and Sukumari Shabar are tribal women from Pandarakhal village in Chandrapur block of Rayagada district. They are part of the Budhi Thakurani SHG. During discussion with them, they said “Due to MUB, we are now able to consume vegetables that were not available earlier. For the first time we ate carrots, radish, spinach, and many other varieties of vegetables. Leafy vegetables are easily available now and are liked by everyone, especially children and elder people in our family. We grow vegetables in our nutrition garden for our own safety. It provides us with good food. Our money is not spent in buying vegetables from the local market. We are able to save our money that is earned through daily wage labour and use it for other purposes.”

Vegetables are no longer seen as a rich man’s diet. One SHG woman in the FGD at Mahulpada village of M. Rampur block in Kalahandi district said, “Earlier we never bought carrots. It was like rich people’s food. We are now able to grow and consume carrots regularly at our place”.



Pic 15 – SHG woman with the harvest from nutrition garden

A Minimum Dietary Diversity for Women (MDD-W) survey was conducted by the RNGOs in February 2020 covering 50 sample households each from 45 project operational blocks across 13 Districts totaling 2250 sample households. The key respondents of this survey were women in the age group of 15-49 years. The objective of this survey was to understand if women consumed at least five out of ten defined food groups on the previous day or night. The survey found that all blocks took steps to establish nutrition gardens at household level. 36 Blocks reported 72-100% coverage of nutrition gardens in sample households during Rabi 2019. 37 blocks reported positive changes on MDD-W score. The survey showed a positive correlation exists between having nutrition gardens and improvement in dietary diversity (MDD score) among women.

Hence, largely it is evident that the MUB initiative has had a strong impact among the people as the benefits were clearly visible and relatable. Improved availability of vegetables not only helped in improving dietary diversity status but also in economic savings and self-sufficiency, which encouraged more people to adopt the project components. As nutrition gardens become a regular feature, the knowledge of people also grew at a fast clip. They understand the economics of growing their own vegetables, and the benefits of consuming them. The women participants in the FGD conducted at Dhobagudi in Rayagada district said that “Buying vegetables from markets is expensive and hence earlier we used to buy much lesser quantities. But because of MUB, now we are able to cook vessels full of vegetables. Because of MUB, households have been able to consume 2-3 additional food groups. We are consuming more vegetables than earlier.”

3.2.3. Adoption of Organic Processes for Cultivation

The project promotes organic cultivation which has benefited people to a large extent. This has resulted in a general appreciation for organically grown vegetables that are considered healthy. The people value it more and have a preference for it. They are also aware of the negative impact of buying vegetables from the outside which are usually grown by using chemicals. People have linked organically grown vegetables as a means to reducing malnutrition and stunting among children. As Haripriya Das, MBK of Tildega village in Sundergarh district said, “When we buy vegetables from outside, we also buy diseases with it due to heavy use of chemicals. By having our own organically grown vegetables, our girl children who will become mothers will get benefited and won’t give birth to weak children.”

Across all the FGDs/meetings done with women as part of this study, it was clear that benefits of MUB have prompted more families to adopt it. The SHGs in Patana block in Keonjhar district said, “Other families are also getting motivated by seeing our MUB. They may not get monetary benefit from MGNREGS but they are growing vegetables for their own needs.”

3.2.4. Food Security During COVID -19 Pandemic

Nutrition gardens were especially helpful during the long-winding Covid-19 pandemic. Being self-sufficient helped rural communities tide over the crisis. During the FGD in Kalahandi, the SHG women mentioned, “Because of the Covid-19 pandemic, there was a dearth of employment and savings got depleted in most households. Markets were closed and people could not buy vegetables. We were able to manage food for our homes because of vegetables from the nutrition gardens.”

Box 8 - “The MUB initiative has been implemented very well in Tangarpada gram panchayat in Patna block. Due to the intervention, women here have come to realize the importance of nutrition for the family. Their understanding on dietary diversity and consumption of safe or organic food is excellent. They do not use chemical fertilizers in their nutrition gardens and use only *handi khat* (organic manure)..” - **Shivanath, Master trainer, Keonjhar**

3.2.5. Reduction in Market Dependency

Box 9 - “One bunch of leafy vegetables cost Rs. 5 to 10 which is too expensive for us. Post MUB, we are getting enough leafy vegetables from our own garden. We harvest as per our requirement and do not buy leafy vegetables from the market anymore.” - **SHG women, Tildega, Sundargarh**

Part of the earlier problem of lack of variety of food items was that people were fully dependent on the local markets to buy the vegetables. Post MUB, the demand-supply mechanics in local vegetable markets have changed. During the FGD in Jagatsinghpur, the women mentioned, “Since vegetables are now readily available in our nutrition gardens, there is no need to go to market and buy. So, our dependency on the market has reduced. The weekly market (*Haat*) is 3 km away from

the village. We buy 2 times from that market in a week and each time we used to spend about INR 300 to 400. These days, we buy only potatoes, onions, garlic, ginger and sometimes cauliflower as we do not grow them in our garden. We spend only about INR 200 for this. Frequency of going to *haat* has also reduced. Instead of twice, some go once a week. Prices of vegetables in the market have also reduced due to increased availability. Earlier, during *Manabasa Laxmi Puja* (a local festival), we used to buy greens, radish and brinjal from the local market. But now we get it from our MUB.”

3.2.6. Increase in Household Disposable Income

As planned and expected, adoption of MUB led to a decrease in household expenditure on nutrition and thus higher savings. A typical response across all FGDs and interviews conducted across districts was, “There is a considerable reduction in expenditure on purchasing vegetables when compared to pre-MUB days. Families are also able to earn some income by selling extra vegetables which help in children’s education and other household expenses.” Another project outcome is additional income generation for rural families, not only through direct sale of home produce but also from indirect savings as a result

Box 10- “Organically grown vegetables give my family good health thus saving potential trips to the doctor. During the lockdown period my family was able to avail financial assistance on account of MGNREGS to manage our family expenses. We are thankful to OLM and the state government for such initiatives which really helped our community.” **Mamata Haldar, Swornapuri village, Umerkote, Ganjam**

of reduced health care expenditure.

3.2.7. More Control of Women on Household Diet

MUB being women-centric, has given a greater control to the women over diets in their homes. Part of the project's progress is attributable to women who have shown great interest and perseverance in following procedures properly to get the desired results from their nutrition gardens. Harsha Trust and Living Farms both are of the view that women are usually responsible for nutrition gardens, and therefore, have greater control over household food consumption decisions than their husbands. Earlier, men used to go to the markets and they used to cook whatever was brought to the home. Now it is not the case.

Box 11 - "Usually in case of family lunches/dinners, women eat the last. Earlier, since the quantity of vegetables was limited, many times there was nothing left for them to eat. Due to MUB, the quantity of vegetables at home is sufficient." – **SHG women, Bandhapalli, Sundargarh**

3.2.8. Impact on Farming Practices

In addition to impact on nutrition and dietary diversity, knowledge and practices in the household, impact of MUB initiative can also be observed in the farming practices of the people. These changes are highlighted below:

Less land, Less Inputs but More Vegetables: Earlier, community members were not aware of the bed system for vegetable cultivation but now they understand its importance and are able to grow different types of vegetables in a small piece of land. Due to adoption of the bed system, more number of vegetables are grown in a systematic way using less land and less inputs. The higher productivity of the MUB is also due to the support given by the ground level staff of OLM. The always-on support system has been instrumental in imparting knowledge and effecting positive behavioral change among people.

Learning of New Skills: The project has helped women farmers learn new skills for a much more efficient way of production. Not only have they gained new knowledge, but also have become confident to plant more nutritious varieties of crops and vegetables in their land. "Earlier we grew some brinjals but the productivity was not that great, because we were not aware about the correct process of cultivating it. Now, we learnt how to prepare soil, how to make bed, how to prepare and apply organic manure, etc. and as a result the productivity is much better than earlier".

3.2.9. Increased Livestock Productivity

Box 12- "Livestock mortality has reduced due to regular vaccination, deworming, and ethnoveterinary medicines. Production from livestock has increased due to better diet. We are giving "bokashi" to goats. Few families have started Azolla cultivation which will be used as livestock feed supplement." - **SHGs –San Jamki Heju, Lanjigarh, Kalahandi**

An important part of this intervention was the methodical approach for managing livestock. The project provided knowledge on good practices and also supported women through Prani Mitras. People have learnt that owning livestock doesn't just mean having livestock with little to no maintenance. From the days of letting animals out to graze on their own and feeding them bare necessities, the outlook of the women has changed completely to vaccinate them in time, adopting deworming methods, and providing them nutritious food. As a result, livestock mortality has

reduced in the community and production from livestock has increased due to better diet. Households have adopted new techniques like Azolla²¹ cultivation which is used as livestock feed supplement.

3.2.10. Productive Time Utilization and Convenience

It was stated by many of the women in the conducted FGDs that they have found that this project has given them the means to do real productive work and contribute meaningfully to their families. The SHG women in Balikuda block in Jagatsinghpur district said, “We are utilizing our time in a productive way. It feels good to work in the garden. Also, when guests visit our house, we can manage with our own vegetables. There is no need to hurry and buy from the market as we can just get the required vegetables from the beds.”

3.2.11. Linkages of SHG Households with Health, Sanitation, and Nutrition Services

SHGs were leveraged to disseminate messages on health, sanitation and nutrition. There are 14 modules as part of PLA-LANN which cover aspects of dietary diversity, mapping of food groups and social security schemes, among others. During the time of data collection for this documentation process PLA-LANN meetings were conducted at SHG level till module 4. In direct support blocks where BLRPs are present, the awareness level among women about health and sanitation was seen to be comparatively higher due to the active involvement of BLRPs and their guidance to the SHGs.

Box 13- Jhili Patra is from Telkoi block of Keonjhar district. Her family suffered from various health issues. She had anemia while one of her sons suffered from malnutrition. With the adoption of MUB and consumption of a good variety of organic homegrown vegetables, the health standards of the members in her family improved. She became a big proponent of MUB and also inspired her SHG and cluster members to take up additional activities like cleaning up the tube well and pond and purchasing iron pans to counter anemia (as promoted by the RNGO, PRADAN). She also participates in VHND and supports ASHA and AWW.

Box 14- Prioritization of issues and decisions taken women’s SHG in Tungurbahal village, Keonjhar

- Cleaning of the area around the tube wells
- Cleanliness around the homes of people
- Clearing of stagnant water around homes
- Use of mosquito nets
- Use of iron vessels for cooking
- Use for Bagada (unpolished) rice which is more nutritious
- Use of earthen pots for storing drinking water to avoid usage of plastic

It was observed across all the districts visited, the SHG women were well aware about the malnutrition cycle and IYCF. They also attend VHNDs / Mamta Diwas regularly. The SHG women give credit to AWC workers, ASHAs and CRPs of OLM for the change in their perspective on health, hygiene and nutrition. For instance, the women in Tungurbahal village of Telkoi, in meeting 2 of PLA-LANN, as part of mapping of current status of undernutrition, SHG members learnt the significance of weight measurement, Mid-Upper Arm Circumference (MUAC) measurement and

uses of growth chart. Earlier when AWCs used to weigh their children, the community members used to scold them and did not allow them to do so. Because, it was a common belief among people that even if the children look under-nourished, they are healthy enough. But now there is a behavioral change in the community and they are more than happy to go to the AWC and ask for their children to be weighed. Similarly, earlier there were taboos with regard to menstruation and adolescent girls

²¹ Azolla, an aquatic fern has a rapid biomass production rate and is high in protein, essential amino acids, vitamins, and minerals. It is promoted as a livestock feed as a valuable protein supplement for many species, including cattle, ruminants, poultry, pigs and fish.

used to be kept in isolation for a week. They were allowed to bathe in ponds but at the section where the water was dirty. However, things have changed in the past 2-3 years. There is an increase in the use of sanitary napkins as they are provided by ASHA didis. This has led to better health and hygiene among adolescent girls.

Sanitation however, is still an issue in most of the villages. Out of 157 households, only 7 households use toilets. The community members practice open defecation and bathe in ponds. In some areas, open defecation persists even though toilets have been built. The issue here is lack of water and the general mindset of people. These aspects need a definite attention in the project, possibly by expanding its scope.

3.2.12. Creation of a Pool of Nutrition Resource Persons

A significant outcome of the project was the development of state, district and community-level capacities for implementation and management of nutrition improvement programmes. Trainings, workshops and demonstrations were undertaken at various levels to build capacities of the functionaries of DMMU, BMMUs and Line Departments (Department of Agriculture, rural development, horticulture and livestock), on key modules of nutrition, vegetable gardening, and livestock production. Special training programmes were designed for the OLM team, MGNREGS team, community cadres, AWCs and others on different nutrition garden models. This has resulted in a significant improvement in the capacity of the government functionaries to implement nutrition programmes.

Box 15 - Earlier, being a KM, I knew about organic farming. But as part of MUB, I learnt many more techniques like liquid manure preparation, *panchagavya*, etc. The learning module for nutrition garden is a very comprehensive one and a lot of thought has gone into its development, keeping in mind nutritional requirements, optimum growth of plants, ease of operations, etc. Earlier people thought that a lot of water may be needed for such an intensive vegetable cultivation method. But when I implemented it on my own, I realized that the use of organic manure keeps the moisture content in the soil intact and hence the water requirement is less. Though I haven't done vermicomposting, but I could see earthworms in the nutri-garden bed. -**Jayanti Nialipali, Master Trainer, Sundergargh**

The cascade model of training was able to create a large pool of trained personnel at the district, block and community levels to facilitate nutrition-sensitive interventions. At present there are 8 Master Trainers per district making a total of 240 Master Trainers for the state. These 240 MTs along with 45 BLRPs and resource persons from RNGOs have provided training to about 11,074 community cadres. The trainings helped them enhance their knowledge of nutrition gardens and livestock management. This eventually translated to better interactions with community members who were enthused enough to start MUBs and get benefitted by enhanced incomes. The training also helped the community cadres like PMs supplement their incomes through a nominal fee that they collect from the people for administering vaccines and for deworming the livestock. Till date 3,42,782 SHG members have been trained. Owing to the relentless efforts put up in capacity development of different stakeholders, the achievement has surpassed the target set by the programme.

3.2.13. Inter-departmental and Schematic Convergence

The project saw the beginning of convergence between state departments and various schemes, RNGOs, and funding agencies. In the MUB initiative, inter departmental and schematic convergence played a significant role and gave the project the required momentum to achieve the desired result.

District level workshops were organized to orient the officials of DMMUs, BMMUs and Line Departments. These workshops enhanced understanding of participants on the project and build their confidence to facilitate convergence with different departments. Some of the examples of such convergence are highlighted below:

Convergence with MGNREGS: The budgetary provision of INR 500 crore from MGNREGS (Rs.10,000/- per nutrition garden) for the establishment of 5 lakh nutrition gardens generated good interest among households from an economic benefit perspective. This also helped them to develop individual assets in the form of nutrition gardens to cater to their daily vegetable requirements. In addition, there were efforts

Box 16 - “There are 22 children in our AWC. Earlier there used to be more children in yellow and red nutritional zones. There are only 4 children in the yellow zone now. I give 3 to 4 types of vegetables to children every day, from the nutrition garden.”

Jamuna Sikaka, AWC, Dhobagudi, Rayagada

to support MUB beneficiaries and enhance their dietary diversity. For example, in Bandhapali village of Sundargarh district, MUB beneficiaries received support from MGNREGS to construct poultry sheds. In addition to vegetables from MUB, protein intake through poultry (as a supplementary activity in convergence with MGNREGS) helps in making available animal protein in diets thus enhancing the quality of nutrition. The convergence of MGNREGS with MUB has strengthened the community members’ access to better nutrition.

Convergence with Horticulture Department: The Directorate of Horticulture (DoH), Govt of Odisha, supported the project by providing seeds and saplings, and conducted several on-field demonstrations at the community level for knowledge and technology transfer. As part of MUB, community nurseries have been promoted through SHGs across the state. The DoH helped in establishment of community nurseries for 500 SHGs by providing relevant training and handholding support. The SHGs have successfully established nurseries of papaya and drumstick plants, which were sold to MGNREGS for planting in nutrition gardens of other MUB farmers. Through the Department and Odisha State Seeds Corporation, (OSSC Ltd), the DoH initiated the supply of 9 lakh banana and lemon saplings for 5 lakh nutrition gardens.

Convergence with Department of Animal Husbandry: The Directorate of Animal Husbandry and Veterinary Services, Govt. of Odisha, supported the MUB initiative by providing necessary training and medicines for vaccination and deworming of poultry birds and goats. It also supported in reviews and vetting of training materials of MUB. 13,413 households received vaccination and deworming support for poultry and goats from the department. RNGOs played an important role in coordination with Block and District level veterinary officials and mobilization of vaccination in 107 blocks.

Convergence with Department of H&FW and W&CD: The project engaged with the frontline workers (FLWs) of the health and women and child development departments. AWCs and ASHAs participated in the training for nutrition garden, especially in need-based blocks where the required number of community cadres were not recruited. As a result, community nutrition gardens have been established at 1375 Anganwadi Centres and 223 schools in six districts (Sambalpur, Rayagada, Kandhamal, Malkangiri, Kalahandi and Sundergarh). In these districts AWCs use the produce from the nutrition gardens like seasonal vegetables and fruits to prepare meals for children.

3.2.14. Creation of a Nutrition Vertical Under OLM

In addition to the verticals of OLM (Livelihoods, Institution and Capacity Building, and Financial

Inclusion), a dedicated nutrition vertical was proposed to facilitate the MUB initiative and help in its sustenance through a focused approach. It was felt that though nutrition is a cross-cutting issue, it requires specific attention to be able to achieve the programme objectives. Else the implementation might have remained in a project mode with the risk of it getting terminated on closure of APF's support window. Since in the government system there was no approval for the nutrition cell, APF was requested for a 3-year initial support for it, which was to be absorbed in the OLM system post completion of the project, to which APF agreed and supported. The creation of the nutrition cell is significant as it was able to sharpen the focus solely on nutrition, which in turn helped the MUB initiative.

As per the understanding with OLM, APF was to support the recruitment of 97 staff (7 at the state level and 3 each in 30 districts) in OLM. However, as per the suggestion of PS, PR&DW, for 7 state level staff positions, APF and OLM did the selection jointly. From an achievement perspective, this objective has only been partially met. In spite of this, the implementation of the project was successful due to the ownership demonstrated by DMMUs and BMMUs along with community cadres of GPLFs. Sustained engagement and interaction of the State Nutrition Team and RNGO experts with the DMMU and BMMU and farmers' experience in developing nutrition gardens during Kharif season of 2019 gave a boost to the programme.



Pic 16 – Vegetables grown in nutrition garden

Table 5 - Snapshot of Pre and Post MUB Scenario at the Village Level (As described by SHG women)	
Pre MUB	Post MUB
Consumption of vegetables was less	Consumption of vegetables has increased
Dependent on local market	Buying vegetables from the market has reduced considerably
Vegetables available in the market are grown using chemical fertilizers	Organically grown vegetables available which are healthier and safer
Used to buy vegetables once a week from the market	Get fresh vegetables from own MUB any time
Cultivated a few vegetables like bottle gourd, ridge gourd, pumpkin, ladies' finger, etc.	Grow new varieties like carrots, beans, snake gourd, <i>kalam saag</i> , etc. in addition to the regular varieties
Buying from the market takes time, effort and money.	Vegetables are readily available. Saves time and money.
Many times, men do not want to go and women have no choice but to depend on them. Men decide what to buy.	Women decide what to cook
Traditional way – few vegetables	Bed system – Production of more varieties of vegetables in a systematic way with less water.

3.3. Voices from Key Stakeholders

Discussions with various stakeholders like government officials across line departments, RNGOs, and APF officials was held as a part of this documentation process. The following feedback was received from these stakeholders on the MUB initiative.

Box 17- Feedbacks received from key stakeholder in terms of impact of MUB initiative
<ul style="list-style-type: none"> ● Relevance - MUB is very relevant for Odisha especially in tribal areas with high malnutrition among women and children. MUB promotes food diversity and a balanced diet, and it has the potential to reduce nutritional deficiency – <i>BDO, Lanjigarh</i> ● Women empowerment - The government's primary focus is on women empowerment through SHGs. MUB is a significant move in this direction as it is implemented through women's SHGs mainly by women farmers. Women's participation in MGNREGS has increased because of MUB as they work in their own backyards/fields – <i>BDO, M Rampur</i> ● Economic impact – The MUB initiative has strengthened the financial condition of the rural households especially because of convergence with MGNREGS during Covid 19. People are getting wages for 33 person-days which is about INR 10,000 including material costs. They work on their own land and do not have to go elsewhere for work – <i>BDO, Telkoi</i> ● Inter-departmental relationship for a common goal – Earlier, MGNREGS, OLM, Department of Horticulture, etc. operated in the same areas but in silos, and were not aware of each other's activities. This project has brought multiple departments work together which is a good template for implementing development projects - <i>DDH, Jagatsinghpur</i> ● Helps achieve government targets - MUB activities helped meet labour creation targets set by the government, during off seasons (June through October) through MGNREGS – <i>BDO, Balikuda</i>.

- **Good demand for MUB** – MUB is very useful not only for the target group but also for the entire household. It has been well-appreciated by community members here. The demand for setting up nutrition gardens is high because people are able to produce their own vegetables and also get paid through MGNREGS – *PD-DRDA, Jagatsinghpur*
- **Improvement in dietary diversity** –“MUB is extremely encouraging. People are able to have locally grown safe-to-consume vegetables. Improvement in dietary diversity of people is quite visible in project areas. The programme is getting scaled up across the state and reaching out to lakhs of households, enabling them to have access to locally grown, safe/poison free diverse vegetables that in turn helps to improve the dietary diversity of the target group. This is quite visible on the ground.” – *Debjeet Sarangi, Living Farms*
- **Utilization of public funding**–“A massive amount of public funding is being utilized for nutrition. There have been a lot of changes at the policy level to fine tune this programme and make it more productive and inclusive. There is integration of different state government departments/ directorates like Horticulture, Animal Husbandry, etc.” – *Debasis Mohapatra, SPM, OLM*
- **Changes in existing social norms**- “We are satisfied that things are moving in the right direction. During Covid-19, the World Bank, Ministry of Rural Development, and Niti Aayog, organized webinars and we shared our experience with MUB. In a similar line, Didi wadi programme is being implemented by JSPLS of Jharkhand. The PLA-LANN method has also started to show its impact at the ground level. For example, in Bhalia Chor panchayat of Begunia pada block, Ganjam district, a SHG woman who had participated in the PLA-LANN exercise decided to not get her daughter married off at a young age. The PLA-LANN meeting helped her analyze the situation better and come to the right decision based on facts. She faced a lot of resistance from her family but she did not give in. Other SHG women supported her and they took a decision at the village level to not let their girls marry at young age.” – *Rajib Kumar Roul, APF.*
- **Created a pathway for CSO collaboration**- “The Mo Upakari Bagicha programme demonstrated a pathway of CSO collaboration with mainstream agencies for large-scale change. The BYP intervention increased intake of animal protein among target women who are in need of it.” – *Surjit Behera, PRADAN*
- **Benefited the vulnerable population at large**- “The MUB initiative has benefitted the vulnerable population. During the peak of COVID-19 pandemic, households having a nutrition garden did not have any problem with regard to the availability of vegetables at their homes as they got it from their gardens. The programme has improved health and nutrition knowledge of SHG women. They have started looking at food through the lens of nutrition. The concept of safe food has also percolated into the communities. Utilization of services provided by AWWs and FLWs has increased. Gradually, more women started attending Mamata Diwas. “- *Soumyajeet Swain, Harsha Trust.*

Chapter 4- MUB as A Good Practice

4.1. Good Practices Comparison vis-à-vis FAO Parameters

The MUB initiative has received a good response from the target beneficiaries and other stakeholders. The study analyses if the project can be compared/justified against standard norms of good practices as defined by the FAO.

Good Practices Parameters as per FAO	Observations
Effective and Successful	<ul style="list-style-type: none"> ● The MUB initiative aims to improve the nutritional status of women and children across the state of Odisha with focus on pregnant women, lactating mothers, adolescent girls and children below 5 years. Since its introduction in 2019, it has been able to reach all 30 districts of the state, helped the target beneficiaries through a strong convergence between different stakeholders, and helped in improving their dietary diversity practices at the household level which aligned with the stated nutritional objectives of the government of Odisha and APF. ● Nutrition garden of MUB is considered as a source of safe and healthy vegetables for the families. It has helped decrease household expenditure on vegetables and bring self-sufficiency in vegetable production. ● The project, by virtue of its training sessions and handholding support provided by community cadres has been able to improve the knowledge of the SHG women on various aspects of health and nutrition.
Environmentally, Economically and Socially Sustainable	<ul style="list-style-type: none"> ● The MUB initiative meets essential needs of the poorest, without compromising the ability to address future needs. The project adopted organic agricultural practices to increase dietary diversity and ensure nutritional security. Important and sustainable practices include soil fertility management, non-chemical pest management, use of open-pollinated variety of seeds which helped in retention of seeds for the next season, crop rotation²² and companion-planting²³, use of locally available materials – live fencing, mulching, integration of livestock management, and promotion of a large variety of vegetables and fruits suited to the climatic conditions of the respective regions. ● The MUB initiative does not require much input investment other than seeds. It has reduced expenditure towards buying vegetables and is a source of an uninterrupted supply of fresh and safe nutritious vegetables. ● The MUB initiative is implemented through SHG members and it has institutionalized mechanisms like conducting PLA-LANN meetings at SHG level to promote community ownership and ensure its sustainability.
Gender Sensitive	<ul style="list-style-type: none"> ● Objectives of the MUB initiative are targeted towards increasing the dietary diversity among women. It targets women's nutritional needs and hence the crop types are selected to address their nutritional requirements. ● The project focuses on building on women's knowledge and skills, as it has developed the capacities of women to carry out the implementation at the ground level. It has given them a platform to learn new practices relating to organic farming and helped women enhance their knowledge of nutrition

²² Crop rotation is a method of farming where a number of different plants are grown one after the other on a field so that the soil stays healthy and fertile i.e., able to produce crops.

²³ Companion planting is the planting of different crops in proximity for pest control, pollination, and to otherwise increase crop productivity.

Good Practices Parameters as per FAO	Observations
	<p>and their access to a much more nutritious diet for themselves and their family.</p> <ul style="list-style-type: none"> • The project does not require heavy manual work or long hours in the garden or with the livestock. Women take on lighter tasks related to planting, weeding, fertilizer preparation and application, and daily garden tending tasks. Also, the use of organic practices is safe for women and has no adverse impact on their health. • The project helps women develop their proficiency in vegetable cultivation and livestock management which in turn makes them meet the needs of their families more easily and economically. This enhances their status within the family and in the society at large as well. • Community cadres are mostly women, and hence women farmers feel more at ease communicating with them.
Technically Feasible	<ul style="list-style-type: none"> • The project is easily implementable. There are no complicated methodologies to be learnt and there are practically no barriers for the beneficiaries to implement the project. The tools and equipment and other inputs used are usually available locally and the processes are easy to follow. • Raw materials required include a small patch of backyard land and external input includes seeds that are provided by OLM for 1st year and further seeds can be safely preserved for use in future. Community cadres handhold the beneficiaries to develop MUB within a short period of time. Demonstration sessions at the community level made it easier for people to undertake MUB.
Inherently Participatory	<ul style="list-style-type: none"> • The project is promoted through SHGs which evidences its participatory nature. SHGs are involved in the entire process commencing from the selection of participants (as per defined criteria), capacity building, and development of nutrition gardens. • Extension strategies take into account women's time and mobility constraints. Training and meetings are conducted in the villages as per women's convenience to increase their participation. • Women farmers have platforms like SHG/CLF meetings to share their experiences, to discuss challenges being faced, which could include water related issues, pest and disease management, sourcing quality seeds, etc.
Replicable and Adaptable	<ul style="list-style-type: none"> • The project has low requirements of seed capital and minimum operational costs. In addition, there is enough guidance provided by OLM team to make the entire adoption process easy. • The project has already been scaled up across 235 blocks in the state giving ample evidence of its fast replicability and scalability. The project is also being replicated in other states like Jharkhand and Maharashtra.
Reducing Disaster/Crisis	<ul style="list-style-type: none"> • The MUB initiative has been able to reduce the nutritional deficit amongst the target group. It has also contributed towards mitigating the additional nutritional challenges posed by the COVID-19 pandemic. • Being low-cost and easily implementable, it holds potential for reducing disaster risks as restarting the process in case of any disaster is easy. • In case of scarcity of water, MUB can even be done in gunny bags using kitchen waste water.

4.2. Innovations/Promising practices in MUB

While working towards achieving the goal and objectives of the MUB initiative, various innovative and promising practices have been adopted as part of the MUB ecosystem to improve its effectiveness and enhance the ease of operations. These are practices which were found to be very appropriate in the given context and environment. In some cases, RNGOs or community cadres introduced some innovative ideas based on their field level experience while in many cases, the community members themselves also developed some good practices. Some of these practices are highlighted below, so that they can be adopted in similar contexts or environments.

- **Vegetable Seed conservation and banks at the community level** – Seeds are critical to the success of nutrition gardens. In order to promote self-sufficiency and reduce dependency on purchasing from the market, Open Pollinated (OP) varieties of seeds are used in MUB. In Rayagada block of Gajapati district, the RNGO Living Farm motivated SHGs to save seeds for future use by storing them in earthen pots, which is a known Indigenous Technical Knowhow (ITK) on seed preservation.
- **Green fencing with multiple benefits** – Henna plants are good as fencing materials in farmlands with their thick undergrowth. In addition to being an environment-friendly natural fence for protecting nutrition gardens, Henna plants also help generate income for the households, because of its cosmetic and medicinal value. In Rampa GP of Chikitti block in Ganjam, some farmers have adopted Henna fencing instead of bamboo, which were difficult to get and had to be replaced every few months. Henna plants require minimal maintenance, do not need much water either, and are also known as pest repellants.
- **Community nursery** – As part of MUB, community nursery has been promoted through SHGs across the state. Trainings on nursery raising and hand holding support was provided by the Directorate of Horticulture. The SHGs have successfully established nurseries of papaya and drumstick plants, which were sold to MGNREGS for planting in nutrition gardens of other MUB farmers. In some districts like Nabarangpur, the SHGs have been able to generate good income from the sale of saplings. However, there are some SHGs who have not been able to monetize their efforts adequately due to lack of business orientation. Nursery raising has good potential to be an income generator due to the consistent demand for good quality plants. There is also scope for growing high quality vegetable saplings in soil less medium (using coco pits and plastic trays in poly houses) which ensure high quality of seedlings and less chances of damage due to pests and fungi.
- **Day shelters for poultry** – Day shelters are enclosures made by nets supported by wood or bamboo columns which are used to keep the flock of birds safe. This helps protect the MUB from birds and also Backyard poultry birds from predators. This is more helpful especially when people go out to work in the fields during the day time and the day shelter is found useful for keeping the birds safe. The day shelter typically provides more space for birds than the night shelters. In Baliguda block of Kandhamal district and other intervention areas of PRADAN, day shelters for poultry have been introduced to the communities.
- **Supplementary feed production for small ruminants and poultry** – Considering the fact that animal protein increases human dietary diversity, it is very important to take care of the nutrition and consequent productivity of livestock. Availability of good quality animal feed is always a challenge. In this scenario, introduction of Azolla, an aquatic fern which can be used in its raw form as well dried form for animals, is helping enhance livestock productivity and in achieving MUB's objectives. Azolla is a low cost and rapid growing edible fern which is a proven growth-promoter

for livestock. This activity has been initially promoted by Harsha Trust and PRADAN in collaboration with Living farm in multiple MUB locations.

Similarly, Bokashi, a supplement for small ruminants which is a mix of paddy husk, wheat crush, maize crush, mustard cake, jaggery and minerals resulting in a protein rich diet, has enabled weight gain in goats. Involvement of SHG members in the production of Bokashi has helped livestock productivity and is also a good revenue source for the SHG members. This has been implemented by PRADAN as part of MUB support in various locations of Kalahandi district.

- **Pushti Mahotsav** –*Pushti Mahotsav* was a large-scale community driven event to propagate the importance of health and nutrition among community members across the state. *Pushti Mahotsav* was a daylong event conducted from 26th to 31st January 2021 in 5300 locations in 1060 Gram Panchayats, spread across 235 blocks in a span of just one week. It showcased diversity of food and agricultural production system in the region through exhibitions and cultural events. Discussions were held on local food varieties and their contribution towards health and nutrition, encouraging traditional, nutrition rich varieties, recognizing good practices in agricultural tradition, food harvesting, etc. This generated a lot of interest among people resulting



Pic 17 – Display of food at Pushti Mahotsav at Dhenkanal



Pic 18 – Cultural programme at Pushti Mahotsav

in 8 to 10 lakh people participating in the event. This event was organized at a short notice and was able to raise awareness on nutrition at a mass scale. Traditional dances, drama, skits, and decorations (like rangoli) were used to emphasize the importance of nutrition in diets. This helped in generating significant awareness about nutrition and its importance among people. Organizing such events for reaching out to people for raising awareness on a

mass scale is a definite good practice and must be replicated.

- **Decentralized process** - During the first season of MUB implementation, target beneficiaries were selected by the DMMUs in consultation with the GPLFs. Once this was done, the cost of seeds, saplings, rose cane and incentives which amounted to INR 1000/- per beneficiary, were transferred to GPLFs. This was a decentralized process and the GPLFs were responsible for timely implementation of activities which included procurement of seeds and saplings. The GPLF cadres were trained by the BLRPs and master trainers, and provided manuals on quality control in procurement which included seed germination tests to determine which seeds could be accepted or rejected from the vendors. Necessary guidance was provided by the respective DMMUs/ BMMUs along with facilitation by the nutrition team at the SMMU. In an agri-nutrition programme

like MUB where vegetables need to be grown 3 times in a year, the most important aspect is timely availability of quality seeds. Active involvement of GPLFs helped maintain this schedule and gave a good start to the programme.

- **Coordination and complementarity** - Coordination, partnership and complementarity among organizations operating in the same area was essential for synergistic convergence of capabilities and resources. There have been multiple interventions by different organizations in the same area. For example, while MUB in Dhobagudi of Rayagada district enhanced self-consumption and access to a wider variety of vegetables, the APC project in the same area helped in increasing household income through commercial vegetable cultivation. Both projects brought their unique strengths to the project which ultimately helped accelerate development in the project villages. Similarly, the high synergy between government and non-government organizations in the project resulted in a higher level of output and proved that both scale and quality are not mutually exclusive and can be achieved together.

The experience gained throughout the project points to a multitude of known good practices and a bunch of on-the-go adaptations and innovations. The documentation and further analysis of such promising practices is expected to provide a deep understanding of how things work best in different situations, and help in replication and up scaling of the project.

5.1. Enablers

The MUB initiative is a large-scale effort backed by multiple stakeholders and an intricate delivery mechanism. There are factors which have worked well for the programme just as there have been challenges. Key among the enabling factors were the support of the state government, involvement of stakeholders in defining the right strategies and executing them, and the commitment by the implementers at the ground level.

Active engagement of policymakers and decision-makers - The state government's commitment to improve nutrition and livelihood for the target communities was exemplified by the agreement for establishment of a nutrition secretariat, appointment of senior government officials to oversee the project, convergence of the project with MGNREGS and allocation of INR 500 crores towards it. The decision of the state government to converge MGNREGS with OLM to create nutrition gardens as individual assets and provisioning of 33 person days, which totals to an amount of around INR 10,000 each for 5 lakh households towards nutrition security in FY 2020-21 provided further momentum to the project. This also helped in scaling up MUB across all blocks in 30 districts of Odisha with additional support of MGNREGS.

Collaborative partnerships – Organizations with different capacities worked together to identify problems, put forth a vision, establish ways forward, and made detailed road maps for the MUB initiative. The institutional structure of OLM established for implementing the project through SHGs and technical support provided by RNGOs worked very well from an implementation perspective. The role played by the community cadres and SHGs at the local level ensured that households have the necessary points of contact to assist them with MUB whenever required.

The positive understanding between the SMMU, DMMU, BMMU and BLRP, and joint planning helped in effective implementation of the project at the ground level. State level ToTs were organized for district and block level officials in all 30 districts to sensitize them on rolling out paper-based MIS. PLA-LANN meetings and livestock management activities helped to build the capacities of the aforementioned officials for successful implementation of PLA-LANN and Livestock management activities in the field. District level workshops organized for sensitizing the officials of DMMU, BMMUs and Line Department Officials augmented the knowledge on the project but also helped to build their confidence to facilitate convergence with different departments.

The OLM State Nutrition Cell worked as a bridge between APF, RNGO, and the State OLM senior management. Sharing of SoPs and guidelines, mentoring and monitoring of the programme, providing training, funding support, etc. were carried out regularly.

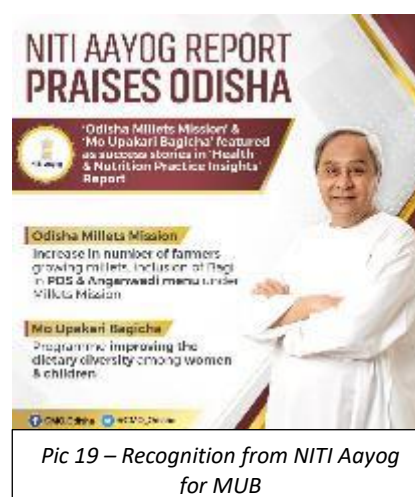
Proactive leadership at district and block levels - The proactive leadership role played at different levels by the government functionaries to improve nutrition and livelihood of target groups helped the project stay its course. Monthly review of the project and other monitoring activities of OLM was done by the Principal Secretary, PR & DW Department and SMD-cum-CEO of OLM through video-conferencing. The district leadership (Collector, PD-DRDA, DPM) monitored and provided the necessary guidance to the programme. DMMUs and BMMUs along with leaders of GPLFs who despite being involved in multiple tasks, led the planning and implementation process of this project. This helped the programme get scaled up at a faster pace.

Existing SHGs and Community Cadres – Community mobilization is a basic requirement for implementation of the nutrition project. The process of formation of SHGs and federations, recruitment of community cadres, providing them with training, and then subsequent training of the SHG members takes years. However, in this project, the SHGs were already mobilized and federated, and community cadres were appointed from the SHGs and trained, which helped in rolling out and scaling up of the programme much faster. Community mobilization, presence of trained community cadres and their motivation enabled a good outreach in a short time. Existing community cadres were trained on PLA-LANN, nutrition garden and livestock management using participatory approaches and by relying more on the process of demonstrations. This created a good resource pool of trained community cadres who provided the necessary technical support to the SHG members as and when required.

On-field demonstration and hand-holding support: This helped in adoption of various components of the MUB. For example, Krishi Mitras demonstrated nutrition gardens in their own lands under the supervision of BLRPs and Master Trainers in each Panchayat. This helped bring conceptual clarity to the community members and build confidence to undertake MUB. Since there was a delay in commencing PLA-LANN, this strategy worked well. The community members were also convinced that over 17 varieties of vegetables could be grown in their backyard, which seemed impossible to them initially.

Direct and need-based support mechanism: In 43 blocks where direct support was provided by the RNGOs, the presence of BLRPs helped in better coordination with BPM, BLC, and community cadre. In 64 blocks where BLRPs were not present, the RNGOs provided need-based support for 3 days per month, which helped DMMU and BMMU to sensitize their staff and create awareness about MUB. It is because of this support that the project, which was supposed to be implemented in 107 blocks as per the plan, was able to reach 235 blocks. Master trainers were also utilized along with BLRPs by other blocks. All key personnel including MGNREGS staff, community cadres, and SHG members were trained and this helped in the development of uniform understanding on nutrition garden models.

Use of technology – Sharing of ideas were done through webinars and documents related to MUBs across the state and outside. These virtual sessions of sharing experience paved the way for replication of the project in Jharkhand and Maharashtra. In addition, the use of print media, publication of articles²⁴, etc. were done which led to the programme being visible both at the state and central levels including NITI Aayog²⁵. Two such virtual sessions were organized using an on-line platform (Zoom) for wider dissemination of project activities and impacts among 50 agriculture scientists of ICAR, based at Pune and among more than 200 officials of Jharkhand State Livelihoods



Pic 19 – Recognition from NITI Aayog for MUB

²⁴ <https://www.aesanetwork.org/wp-content/uploads/2020/08/AESA-GP-28-DEC-19.pdf> ,

<https://30stades.com/2020/10/09/odisha-women-fight-malnutrition-through-organic-farming-in-nutrition-gardens-mgnrega>

²⁵ https://niti.gov.in/sites/default/files/2020-08/Practice_Insight_Vol_II.pdf

Promotion Society (JSLPS). All participants actively partook and learnt about various project activities and their genesis from representatives of RNGOs, APF and SMMU. Few representatives of the World Bank and other institutions like the Ministry of Rural Development and NITI Aayog also joined and contributed positively to the deliberations. Usage of tools like WhatsApp helped monitor the project remotely. This came in handy since the project did not have a standardized MIS to capture real time data. However, at a later stage ODK was used for GIS enabled data and photo capture at the field level.

Effective monitoring mechanisms - Monitoring indicators were discussed, identified and integrated with the OLM MIS system for updating them every month by the district teams. Monthly review of the project is also done by Principal Secretary, PR & DW Department and SMD-cum-CEO, OLM through video-conferencing along with other activities of OLM. Periodic field visits were undertaken by the State Nutrition team and other members of OLM to different districts and blocks for providing handholding support, guiding and supervising the progress of the project. But COVID-19 pandemic restricted the field movements of state teams for more than 6 months. However, the review meetings were managed through virtual platforms.

Community Campaigns: Campaigns like *Pushti Mahotsav* (Nutrition Festival) acted as an important enabler for disseminating message of nutrition and nutrition garden in a wider scale. During field visit it was noticed that the festival created a buzz at the community level and helped raise awareness on nutrition at a mass scale. The exhibitions on food, both cooked and uncooked items, fruits, vegetables, milk, etc. and discussions were very impactful for improving the knowledge and behaviour of pregnant women, lactating mothers, and other community members on dietary diversity and consumption of nutritious foods.



Pic 20 – Flyer of Pushti Mahotsav



Pic 21 – Display of Varieties of Food Items in Pushti Mahotsav

Cascade training- The training was carried out in cascade mode in which the RNGOs with support from the State Nutrition Team provided training to Master Trainers who trained the community cadre who

in turn trained the SHG members. All key personnel including OLM and MGNREGS staff, community cadres, and SHG members were trained and this helped in the development of uniform understanding on the nutrition garden model.

Customized training material - Training materials were provided as reference documents at different levels starting from master trainers to community cadres to prevent dilution and/or misinterpretation of key messages and learning loss in between. Customization of training materials for different levels of trainees helped them understand the concepts faster and better and this definitely was an enabler to the programme. The programme has also seen active involvement of master trainers in planning and rolling out training programmes in some districts. In some cases, the trainers went beyond their standard training material and created audio-visual tools to improve the training process and outcomes.

Box 18 - The module for training developed by the RNGOs is very informative, relevant, easy to understand and helpful. We use locally available resources are used for providing training. The training material provided is also apt and helps trainers improve their knowledge substantially.
--Master Trainers, Kalahandi

Technical expertise and commitment of RNGOs - The technical expertise of RNGO was a definite enabling factor for this project. The RNGOs developed the training materials /content based on their experience in various domains of MUB. For example, Living Farms had expertise in PLA-LANN and nutrition gardens, whereas Harsha Trust and PRADAN had expertise in nutrition gardens and livestock management. This expertise of RNGOs in different domains of MUB helped in the development of good quality training material. The RNGOs associated with the MUB initiative were already experienced in working in the project areas which ensured that the technical advice and practices are followed appropriately. In direct support blocks, the BLRPs with support of BMMUs took the leadership in planning, implementation and regular follow-up of activities at field level which enabled them to achieve the visible results.

Pilot Phase of the Project- The project started off with a smaller pilot which brought about a good understanding on the possible role of nutrition garden in improving dietary diversity and enhancing nutritional standards among the target groups. This was the bedrock for the scale up of the programme across multiple districts.

Good physical infrastructure and connectivity - Over the course of conducting field visits for this documentation exercise, it was noticed that the physical infrastructure like all-weather roads connected to the villages was an enabler to the MUB initiative. Because, the key stakeholders like community cadres and government officials find it easy to reach the villages. In addition, good mobile network connectivity in the project areas (barring a few districts) helped in better project monitoring and information sharing.

Convergence with various line departments - The project has seen good coordination with various line departments in the state. For example, the FARD department has insufficient manpower which affects their service delivery in terms of both curative and preventive (vaccinations, deworming, etc.) measures for poultry birds and goats. In such circumstances, the support of community cadres, especially Prani Mitras, were very helpful in bridging the gaps in service delivery. The Horticulture Department provided training and handholding support on nursery-raising to SHGs. They also provided micro-irrigation support, vetting of saplings, and certification of OP varieties of seeds. Thus, establishment of linkages with service providers helped the project in a major way.

Support provided by APF to the project – APF’s partnership with the government, support in conceptualizing the project and developing the project structure and regular mentoring and monitoring the project, were found to be significant enablers to the project. Six monthly Reflection Learning and Change Visits (RLC) paved the way for several concurrent / mid-course changes. Third party impact evaluation by Oxford Policy Management (an agency hired by APF) is also helping the project for strong grounding of activities.

Community preparedness – This is essential for the project to commence and its sustainability. Community mobilization, presence of trained community cadres and their motivation enabled a good outreach in a short time. Existing community cadres were trained on PLA-LANN, nutrition garden and livestock management using participatory approach and by relying more on demonstration. This created a good resource pool of trained community cadres who provided the necessary technical support to the SHG members as and when required.

Community and cadre-friendly IEC and Training Materials- The use of picture-based training materials and local language played key roles in developing the understanding of the community and cadre about the project. This was especially helpful considering the low level of literacy of the population.

Availability of Programmatic Guidelines and SoPs - Creation of SoPs and manuals both in English and Odia helped in consistency of delivery and wide coverage of the MUB initiative. This helped in smooth implementation and monitoring of the initiative. This also helped in maintaining continuity by establishing set processes.

5.2. Challenges

A project of such a large magnitude has its share of challenges primarily due to the scale of operations, a large number of ground staff and the sheer complexity of preparing the work plans across the geographic spectrum. MUB is a successful initiative which has benefitted the vulnerable sections and incorporating improvements to it is an ongoing process like any other large project which needs to be perfected over time. The Covid-19 pandemic-inflicted times of today have further amplified the challenges which tests the resilience of the project.

Local Availability of Indigenous Seeds - Lack of timely availability of indigenous seeds and saplings at the community level emerged as one of the biggest challenges for the project. There have been instances where seeds could not be made available in time for the second season of cropping. Hence, households were not able to sow at the right time leading to non-utilization of resources. The plan was to enable households to cultivate for 3 seasons so that they could get used to producing fruits and vegetables from their own gardens and would be able to reduce the dependency on external produce for their dietary needs. It is clear that the seed procurement and distribution system needs strengthening. In some cases, seeds provided did not germinate properly and people had to use seeds available in the local market as replacement. This defeats the purpose of using indigenous or open pollinated (OP) seeds.

Issues related to MGNREGS - MGNREGS has helped people develop nutrition gardens as an individual asset and address malnutrition mostly at the household level. MGNREGS wage is a major motivator to establish nutrition gardens. However, landless people were unable to be part of the MUB initiative. Before convergence with MGNREGS, the bag model was promoted for landless people to grow

selected vegetables in small quantities. However, there is no incentive from MGNREGS for this method of cultivation for landless households. In order to expand MUBs to weaker sections, the scheme needs to be revisited to include such categories of people. This could happen by allowing them to use common lands, or lands under the Forest Rights Act where landless people can grow vegetables and earn income through MGNREGS. Some other challenges related to MGNREGS are:

- Feedback from the ground level suggests that in some areas, there is political interference in selection of beneficiaries resulting in exclusion of more needy people who are not reached out for MUB.
- Key functionaries in the MGNREGS system like Gram Rozgar Sevak (GRS) and Junior Engineer (JE) do not show much interest in MUB as they have a lot of responsibilities to fulfill for regular MGNREGS work.
- The small farm ponds incorporated in the MGNREGS model of nutrition gardens have not served the purpose fully, as most districts face water shortages especially during summers. During the rainy season, there is no requirement of farm ponds.
- There have been instances of delay and non-receipt of MGNREGS wages allocated for MUB. Many households have not received the full amount for preparing the beds for nutrition gardens from MGNREGS. In some cases, SHGs have not received the cost of saplings / wages for developing nurseries of Papaya and Drumstick from BDOs.

Water Scarcity - Water scarcity is a major problem in most of the districts in summers, mainly in the western and southern tribal dominated districts and in late winter specifically in Nuapada and Bolangir districts of the state. People find it difficult to even get drinking water. In such a scenario, water to nutrition gardens becomes the second priority. Motivating households to carry out MUB in gunny bags could be the right solution in such cases. Even water used for washing hands after food (lunch and dinner) can be sufficient to sustain plants in a few gunny bags.

Inadequate focus on livestock development – In some areas, backyard poultry and goat-rearing did not receive as much attention as nutrition gardens. In most cases, vaccination and deworming services have been provided by the PMs in coordination with the Veterinary Department. However, in some cases, certain households with BYP were not keen to get vaccination or deworming done. In some places, the Prani Mitras mentioned that the target women ask if seeds can be given free for a nutrition garden, then why are user-fees charged for vaccination and deworming.

Market orientation – It was observed that in some cases, farmers are interested to use their nutrition garden produce for household consumption and to sell the surplus in the market. In some other cases, the produce is sold instead of consumption at home without much consideration for meeting nutritional requirements of the family. The MUB in such cases is seen only as a means to earn some income. This is undoubtedly a challenge to ascertain the actual intention of the farmer. However, as the focus of MUB is to enhance dietary diversity amongst people in nutrition-deficient areas, measures need to be taken to reiterate the importance of nutrition garden is mainly for self-consumption so that they do not have to have a nutrition-deficit diet. PLA-LANN meetings conducted for SHGs can be the best platform to address this.

Effective management of multiple assignments by community cadres: Community cadres are involved in a variety of tasks and it is a challenge for them to devote quality time in facilitating the community centered development process. At times, their payments get delayed which affects their motivation to work.

Inadequate human resources – A major constraint is often the lack of well-trained extension staff to oversee a huge number of MUBs. There is a shortage of staff in many districts. For example, there is only one AHO in Horticulture for managing 3 blocks (Muniguda, Bissam Cuttack and Chandrapur) in Rayagada district. In many districts like Rayagada OLM is understaffed. The existing staff has a lot on their plate and this affects activities like effective last mile monitoring. The number of MUBs is high and the overall management of the programme involves multiple activities. Recruitment of the required number of staff could not be completed which affected the project progress. For instance, due to lack of adequate staff, monitoring and handholding support to the work of community cadres gets hampered. In some places where RNGOs provide direct support, BLRPs are involved in handholding, demonstration, planning and monitoring activities.

Data Management - Delay in establishing an online MIS affected real-time monitoring of the programme. This could have helped negate the impact of staff shortage to some extent. Manual MIS was time-consuming, and made it difficult to triangulate the progress.

Coordination among departments - Each government department has its own mandate and priority areas. For example, an afforestation programme by the Forests Department is unlikely to consider the dietary needs of the local communities. It is unlikely that they would look out for biodiversity aspects during afforestation drives. Instead, it is more likely that they would opt for a fast-growing timber/commercial plant, which will meet their objectives but will result in limiting communities' access to uncultivated foods. Specific departments may be in sync with the need to address nutrition but changing the mindset of the entire department which includes orientation of their project, budget allocation, and reorienting the mindset of top-level bureaucrats to community cadres is a big task. Hence nutrition budget tracking and creating a Secretariat of Nutrition as well as Odisha Nutrition Action Plan could be accorded greater significance to bring the right focus on nutrition across departments.

Training-related issues

- **Under-utilization of master trainers** - As part of the withdrawal strategy, master trainers are supposed to train community cadres and capacitate them. However, not all training happened as per schedule, and in many cases, DPMs and BPMs provided training through BLRPs. Hence, master trainers were not utilized properly. Livestock trainers have been underutilized. They have raised concerns that since they are not involved in providing training to Prani Mitras and community cadres on livestock, they may forget whatever they learned in the trainings. As some of the BLRPs have good knowledge and experience in livestock related training, they conduct it for the community cadres.
- **Delay in payments** - There have been delays in release of payments to trainers. In some cases, the delay was more than six months which took a toll on the motivation levels of trainers. OLM district team needs to be cognizant about this and ensure that payments are released in time.
- **Delays in training materials** - At the initial stage of the programme, there were delays in developing/providing training materials which affected the training and programme schedule. This is still an issue in some districts. In one such instance, training materials were dispatched to the district level but it took time to distribute the material to master trainers and community cadres. This affected the learning retention of trainers and impacted training downstream.
- **Limited handholding support**- The trainers are involved in training of community cadres. In

the absence of proper follow up and handholding support, the trainers have limited knowledge of how the community cadres are providing downstream training to the SHGs. Since there is no scope to observe it, they are unable to address the learning gaps, if any. Some cadres do call over phone from the field when they have any issues or when they forget something. A process needs to be set-up to handle such queries in a standardized manner.

- **Delay in administering PLA-LANN-** Though PLA-LANN was designed to be completed during the initial stage of implementation to create demand at the community level for nutrition garden and livestock management, there have been delays in its administration primarily due to the COVID-19 pandemic.
- In case of non-intensive districts, where there are no community cadres, Master Trainers provide training to AWWs, ASHAs and SHG members. AWWs do not show much interest and are irregular in attendance. Women understand the basics of nutrition gardens but deeper understanding on aspects like crop rotation, combination of plants for better growth, etc. is yet to be created. This can be addressed through intensive and refresher training conducted at regular intervals.

5.3. Lessons Learned

Dedicated thematic vertical and special budgetary provision - Integration of nutrition as a theme in the OLM's vertical and allocation of budget helped MUB achieve its objectives. This helped bring the necessary focus and finances to execute the initiative.

Capacity building and leadership of cadres and community members – A major constraint in interventions covering remote rural areas is often the lack of well-trained extension staff. To counter this, the MUB initiative took the path of implementing a 'training of the trainers' system, where experienced trainers train a cadre of local extension staff. The latter then provides training and lends handholding support to the community members. This method worked well and can be incorporated in similar large-scale programmes.

Optimal utilization of existing resources and platforms - OLM utilized its existing SHG platform, community cadres, and human resources at the block, district, and state levels to roll out the MUB initiative. This enabled faster adoption of the MUB initiative along with effective utilization of existing resources.

Experiential participation is must - It was observed that even in areas which had lower literacy levels among women, their understanding of technicalities related to the MUB was considerably good. This was possible due to the use of demonstrations on various aspects of MUB. In addition to training, demonstrations on nutrition gardens at each Panchayat helped in bringing conceptual clarity to the community members and helped them to have confidence to undertake MUB. Hence, it is clear that for a large-scale community outreach programme like MUB, 'learning by seeing' and 'learning by doing' are more reliable and impactful.

Buy-in of leadership at different levels - The leadership at different levels (State – Departments, District – Collector/PD-DRDA/DPMs, Block – BDOs/BPMs/BLCs) could visualize the potential of MUB to bring about changes in the nutrition standards of people in the state. District administration, State Mission Director, department heads have been very supportive of the implementation of this project. Their active involvement played a major role in convergence with MGNREGS and other line departments. It is important to invest time and effort to create active interest among key decision makers.

Inter-departmental and grassroots convergence - The convergence of multiple departments working together to expand the MUB initiative played a key role in its progression. The MUB intervention was supported by the Directorate of Horticulture, MGNREGS, Directorate of Animal Husbandry, among others, to fortify the offering. This pooling of resources helped in faster scaling up of MUB. The point here is that for a long time, the departments with excellent expertise have worked in silos with underwhelming results. But the introduction of MUB broke this silo and gathered the strengths of different sectors by design, which needs to be enabled in similar replications.

Technical support to the government staff - Technical support provided to the government staff for implementing a project on addressing nutrition helped to achieve desired results. Government agencies are capable of delivering such an initiative on a large scale if the key people in the system are agreed for periodic desk and field reviews.

PLA – LANN—As part of the PLA-LANN training, the target communities were involved in analyzing their own issues, coming up with possible solutions and adopting them. This method gave them the necessary programme ownership which helped in programme sustainability.

Maintaining quality of intervention - Nutrition projects are often expected to expand rapidly. The focus has been primarily on a horizontal scale-up, with reporting often focused on numbers of people or institutions reached but not on the quality of that coverage. i.e., quantity over quality. In order to maintain quality which will actually help in the malnutrition reduction objectives of the state government, necessary indicators need to be built in which can be monitored. Else the programme runs the risk of covering the entire state but with feeble adoption by participants.

Achieving equity at scale - Projects without a specific mandate to target vulnerable populations often fail to provide coverage to those who are especially hard to reach. MGNREGS helped increase the outreach of the project and improve nutrition standards of the target households. On the flip side, the landless people who are very often more vulnerable could not be included in the MGNREGS phase which hampered the outcome of the project. The MUB initiative needs to strategize to cover the most vulnerable to achieve the nutrition objectives.

Creation of standardized processes – Creation of SoPs and manuals is necessary for consistency in delivery and a wide coverage of projects like MUB. This helps in smooth implementation and monitoring. This also helps in maintaining continuity by establishing set processes.

Widening the scope of relevant inputs - It is suggested to provide more varieties and number of fruit saplings to cater to various nutritional requirements of the target groups. For example, jackfruit, guava, jamun, custard apple, orange, *ber* (jujube), etc. Local climatic conditions, choice of farmers and availability of land need to be taken into consideration which can ensure a higher rate of acceptance and hence prove beneficial from a replicability perspective. Many households do not have required agricultural tools like *khurpi*²⁶, crowbar, rose cane used in MUBs. Project support for improved agricultural tools to SHGs will help in farming operations.

²⁶ A short handled cutting tool with a flat bladed used for digging soil and weeding in small farms/vegetable gardens.

Chapter 6 – Sustainability of MUB

The MUB initiative was planned to be implemented in a phased manner through SHGs of OLM with the primary objective of it being self-sustaining. The initial pilot phase was carried out in 2 districts (Kalahandi and Rayagada) primarily by the RNGO, Living Farms with support from APF. Based on the experience and learning from this pilot phase, OLM replicated it with the support of RNGOs in 107 blocks in year one of implementation and further replicated it all over Odisha subsequently in the final phase (by the 3rd year of the project). Further, the plan was for OLM to implement it independently while the RNGOs were to have a supporting role and withdraw afterwards. From the 4th year onwards, OLM would continue the implementation independently. However, there were some intermittent changes effected primarily due to extraneous factors like COVID-19 pandemic which altered the course of the implementation plan. Due to COVID-19 pandemic, the state government, based on the feedback from district administration concluded that this project was helping rural households with nutrition during the lockdown and took the decision to converge MGNREGS with MUB to accommodate the financial needs of the local and migrant returnees who were in dire straits.

The sustainability aspect of the project in relation to the environment, social and economic dimensions, on the basis of discussions with stakeholders at different levels, is illustrated below.

6.1. Sustainability in Relation to Environment

The MUB initiative adopted organic agricultural practices to increase dietary diversity and ensure nutritional security of the target groups.

- **Soil fertility management** – The project promotes use of animal manure, compost, off-farm organic wastes and other natural fertilizers (like plantation of legumes in enhance soil fertility through biological nitrogen fixation) to improve soil health and in turn increase yields/ productivity. Organic practices minimize use of soil nutrient reserves and improve the physical and chemical properties of soil. The ingredients used for this are easily available locally at homes and are also made available by the support of OLM which makes it a sustainable process.
- **Non chemical pest management** – This includes low-cost, environmentally friendly bio-pesticides like Agneyastra²⁷, or ecosystem-based pest controls like planting trap crops i.e., marigold, etc.
- **Open-pollinated variety of seeds** - Being the main input for MUBs, preservation of seeds by SHGs is a good initiative for the communities to be self-reliant. Open-pollinated (OP) seeds can be saved for future planting, reducing the need to buy seeds year after year.
- **Planting methods** - Crop rotation and companion-planting are practiced to make the best use of space and nutrients. This includes combinations of sun-loving and shade-loving crops, leguminous and non-leguminous crops, and heavy-feeders and light-feeders. These methods increase productivity by improving soil nutrient levels and breaking crop pest cycles. These are

²⁷ Organic pest control solution which is prepared by using cow urine, garlic, green chilies and neem leaves

well researched methods and relevant training is provided by community cadres. This overall system has given remarkable outputs in terms of production of vegetables, and is an important component for sustaining the MUB initiative.

- **Use of locally available materials** – The programme relies on minimum to no external inputs in order to promote self-reliance. This includes bio-fencing to help protect the nutrition garden, mulching, and pitchers for irrigation to reduce water use during summer, among others. Use of locally available resources that do not use fossil fuels, inflict minimal environmental stresses or carbon footprint and are cost effective, are noteworthy aspects of the programme.
- **Integration of livestock management (Goats and BYPs)** - Most rural families especially tribal communities rear livestock. Integration of farming with livestock increased the sustainability of organic systems by way of animal manure and compost to enhance soil fertility.
- **Vegetables and fruits suited to geo climatic conditions** – The project promotes production of varieties of vegetables and fruit plants which are suited to the climatic conditions of the respective regions. This is important for sustainability of the project across regions.

6.2. Sustainability in Relation to Social Well-being

MUB has provided an opportunity to the target beneficiaries to enhance their nutritional standards through inputs, capacity building, and extension support, leading to a direct contribution to their well-being. The nutrition gardens provide diversified nutritious vegetables to meet the consumption requirement of the target households. The vegetables are considered healthy as they are organically grown. The project has enhanced self-sufficiency in terms of vegetable production for self-consumption.

- **Community owned and community managed** – The programme is being implemented through SHG members. It also sensitizes the next level of SHG associative tier i.e the GPLFs which play a key role in the overall development of women of the Panchayats. The project has mechanisms for building ownership by way of PLA-LANN training to SHGs. The PLA-LANN training is administered to the participants where they reflect upon their current health and nutrition situation, identify underlying causes, prioritize issues, take collective decisions to address them, implement solutions and evaluate them. This structured approach contributes towards community ownership and is the key to sustainability of MUB.
- **Sustainable models developed for knowledge sharing** – Knowledge transmission in the project is based on a cascading model to the final unit (the household/SHG member). Field level demonstrations and handholding at each step are critical components in ensuring that there is no loss of interest or knowledge at any point. The process has catalysts like Krishi Mitra and Prani Mitra who ensure that help is available at all times in the project locations. Two different sets of training materials have been developed. One set is for CRPs to use for the training of SHG members. These materials are mostly in pictorial form and has less text. The second set of materials are developed for the master trainers, with more reference material. This systematic method has proved very useful in imparting training in a manner which helps and handholds people continuously leading them to successful outcomes. Being a key last mile connector, the knowledge dissemination process is important for the sustainability of MUB.

6.3. Sustainability in Relation to Economic Resilience

The project has been designed to minimize costs to the target households and yet provide sustainable economic value.

- **Production cost minimization**– A typical nutrition garden requires very little external inputs. The major ingredients are seeds and compost. The seeds used in the nutrition garden which are provided by OLM are of the OP variety which can be saved and used for the next crop, while inputs like non-synthetic fertilizers and pesticides are made at the household level itself. Farmers are trained on how to prepare inputs using locally available materials. For BYPs and goat rearing, vaccination and deworming is done at a very nominal cost by Prani Mitras through linkages with the Animal Husbandry Department. In addition, good quality animal feed like Azolla and Bokashi is locally made at considerably lower costs. The project has increased household income by lowering production and energy costs through on-farm production of feed and fertilizer. Affordability is a very important point especially considering the beneficiaries are in the rural hinterland where incomes typically are low. This project is able to demonstrate a high value proposition at minimal costs which helps with community buy-in, and therefore is critical to sustainability of MUB.
- **Increase in savings**– One of the major benefits has been the development of self-sufficiency at a granular level. The dependency of households on the local market for vegetables has reduced considerably which has resulted in increased household savings. This value proposition along with availability of fresh and healthy produce in their backyard is a motivator for households to continue with the initiative and consequently helps in project sustainability.

Chapter 7 – Replicability of MUB

The Global Nutrition Report (GNR) released by WHO in 2020²⁸ mentions that malnutrition continues to be a concern in India and even more aggravated because of the COVID-19 pandemic. India is among 88 countries that are likely to miss global nutrition targets by 2025. It also mentions that half of the women of reproductive age (WRA) are anemic and India has the highest rate of domestic inequalities for food access and hence malnutrition.

In this backdrop, the MUB initiative has made considerable progress in terms of improving dietary diversity among the target population in Odisha. It has been able to increase outreach and generate visible outcomes by establishing a process-driven approach across the state.

The project is easy to implement, cost-effective, supported by stakeholders with clear objectives, and proven to be beneficial and accepted by the target audience at the ground level, all of which are essential ingredients for replicability.

The concept of nutrition garden is based on sound evidence generated by studies conducted in the pilot project areas of Kalahandi and Rayagada districts, prior to actual launch of the project. Impact assessment carried out in five programme blocks over the magnitude of change observed in five matching control blocks within the same districts showed statistically significant impact in terms of both maternal and child dietary diversity. The learnings from the pilot project were used to design the current project. The project was further developed in consultation with a range of stakeholders which included government departments, NGOs, and funding partners. Changes were made periodically based on ground level experiences and requirements.

7.1. Key Aspects for Replication

The key aspects in the replicability of MUBs are as follows:

7.1.1. Community Mobilization

The first step is to increase awareness on health and nutrition and motivate communities to take necessary actions for their own well-being. OLM being the implementer of the project, used its existing SHG platform to roll out the MUB. The process of formation of SHGs and federations, recruitment of community cadre, providing them with training on SHG management, and subsequent training of the SHG members for bank and other programme linkages usually takes years. However, in this project, the SHGs were already mobilized and federated. Community cadres were appointed from the SHGs and trained which helped in faster roll out and scale up of the MUB initiative. Hence, using existing SHGs as platforms if already available for implementing interventions like MUB will have a better outcome at a lower cost. For example, in other SRLMs where similar SHG platforms exist, it would be easier to replicate the MUB initiative. PLA-LANN through SHGs helped in initiating community dialogue on the existing situation, increasing community knowledge on health and nutrition, devising a roadmap to address issues and creating demand for services based on their identified needs.

7.1.2. Capacity Building

The capacity development process through training and demonstrations adopted in this MUB initiative is the next component which is replicable. Training could be provided either directly to the women farmers or through SHGs. The SHG route has proven to be more effective because of peer

²⁸ <https://globalnutritionreport.org/reports/2020-global-nutrition-report/>

motivation and support. Learning through demonstration has been more effective especially in areas where literacy rates are quite low. Sticking to the core objective of enhancing nutrition intake, the fundamental input given to people is that consumption of vegetables is essential for better individual and community health. Once this is accepted by the target groups, the learning moves to the next phase of how production can be done at the household level itself after which the details of the nutrition garden are illustrated.

7.1.3. Input Support

The input support mechanism by way of seeds and saplings helps farmers adopt the model faster and this process is replicable. The seeds and saplings provided are well-suited to the local climatic conditions and are easily available. This aspect of the MUB initiative can be easily replicated in other locations. Provision of different types of seeds for 3 seasons helps in growing vegetables round the year and enhances access to different types of vegetables. The minimum number of seeds which was provided as part of MUB was of 10 varieties which can be obtained at a cost of around INR 50-60/-. If the households bear this cost, then there are higher chances of acceptability, better ownership and care and management of nutrition gardens.

7.1.4. The Nutrition Garden Model

It is a well-planned intervention which is designed keeping in mind the nutrition requirements of the target groups. The aim was for each nutrition garden to produce 1 kg of vegetables and fruits per day which is sufficient to meet the nutritional requirement of 4 family members. The crops were selected based on the nutritional requirement of the target group. For example, as anemia is prevalent among the target women and hence iron rich vegetables like spinach, drumstick, and other green leafy vegetables, were promoted.

This model is easily adaptable based on nutritional requirements, local food consumption patterns, availability of land and climatic conditions of the area. A well-developed nutrition garden has the capability of fulfilling the daily dietary requirements of a family by supplying most of the nutritionally rich non-staple foods such as vegetables, roots and tubers, and fruits, legumes, and spices.

7.2. Factors Favouring Replicability

Intensive interactions with a wide cross section of stakeholders helped this study pick out some simple but key aspects which have made the MUB initiative well accepted in the target areas. Some of these, like integration with MGNREGS, was not planned for initially and came into the programme later on, but played an important role in its spread. Following these pointers is more likely to make a replication successful.

7.2.1. Use of Women SHG Platform

The project is implemented mainly through women's groups and hence is mostly led by women. This has a positive impact on intended outcomes. This facilitates active participation of women, inclusion of the target groups and most marginalized households.

Box 19 - Women should be leading the nutrition sensitive programmes. It is seen that in general women tend to focus more on nutritional aspects where men focus more on market-oriented production.
-- Devjeet Sarangi, Living Farms

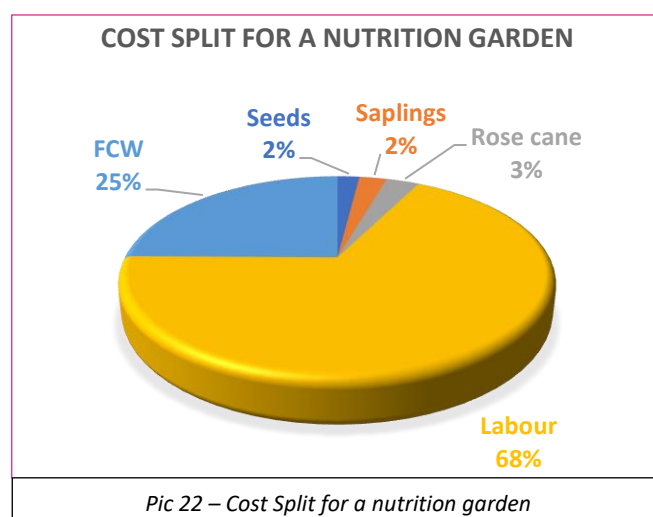
7.2.2. Useful for Both Landed and Landless Households

MUB can be implemented in any location. Availability of about 2-3 decimals of land is ideal which can take care of the nutrition requirements of an average household of 4-5 members. In case land is not available to this extent, then the landless or gunny bag models can be adopted which can partially fulfil vegetable requirements of a family.

7.2.3. Keeping Costs Low

MUBs do not give much financial burden to the households. The cost of seeds is minimum (less than INR 100 per season). Use of Open Pollinator (OP) variety helps preserve seeds for consecutive seasons. Decentralized seed banks at the community level ensure continuous availability of seeds at the right time and in the right quantities. It also helps not to depend on market forces. Not much effort or outside labour is required in maintaining the garden either as the area under cultivation is very less but enough to meet an average family's nutrition requirements.

Table 6 - Cost calculations and returns for a NG	
Particulars	INR
13-17 types of vegetable Seeds	200
10 types of fruit Saplings	250
Rose cane for irrigation	300
Labour cost @ INR 207 per day for 33 days	6831
Green fencing, compost pit, water tank (FCW)	2500
Total cost	10081
Returns	
1 kg of vegetables after 2-3 months	
Avg. cost of vegetables/kg - INR 40	
Total 252 days required to recoup investment	



7.2.4. Integration of Livestock Management

One of the most important points in establishing a nutrition garden is the use of organic manure and non-synthetic pest control measures. Most rural families, especially tribal families rear small livestock (BYP and goats). Integration of farming with livestock increases the sustainability of organic systems by way of animal manure and compost to enhance soil fertility. This factor is extremely beneficial and is easy to replicate because of the availability of livestock in most rural households. In addition, the use of animal protein in the form of eggs and meat is an essential part of dietary diversity.

7.2.5. Ensuring Water Availability

If sufficient water is available, vegetables can be grown round the year (all three seasons). A nutrition garden in 3 decimals of land requires about 30-50 litres of water daily. During summer the water requirement increases which could become a problem in some regions. Replicability of MUB will be easier in areas where water is readily available. However, use of organic compost and mulching helps in reducing water requirements as they trap moisture and reduce evaporation loss. Use of pitcher irrigation, rose cane, etc. helps in better utilization of water. In addition, use of waste water from the kitchen and household can also be of help. These methods of water utilization can help nutrition gardens flourish in more arid regions thus improving the scale of replicability.

7.2.6. Convergence

A multi-sectoral approach and convergence amongst different departments, schemes and stakeholders enhances complementarity of efforts, leading to better utilization of resources, expertise and public services for optimal benefit of the target groups. Convergence efforts at the state, district, block and village levels as described earlier in this report helped the MUB initiative in terms of financial support, technical knowledge, inputs, extension services, among others. Good working partnerships between different stakeholders enabled scaling up of the intervention and enhanced outreach efforts across the state in a short span of time.

7.2.7. Government Commitment

Changes at policy level indicate the continued interest of key stakeholders including the government which help in improvising the project and consequently its outcome. For example, the convergence with MGNREGS was a successful change which added more value to the beneficiaries.

Chapter 8 – Conclusion

Considering the precarity of the malnutrition scenario in the state of Odisha, it was imperative that swift actions needed to be taken to design workable strategies, commence implementation and eventually scale up across the state for moving the needle in the right direction.

The state government put in commendable efforts to reduce the malnutrition numbers over the past 10 years, but the rate was still significantly high in 2018. The government did well to invite more stakeholders to partner it in projects to address malnutrition. The collaboration of APF set the pace of work and the MUB initiative was then conceptualized.

A robust plan was set-up to implement MUB across the state along with OLM through its SHGs with all the necessary plans and delivery structures put in. This included support from other line departments of the state government who provided their expertise in areas like training and funding (MGNREGS), using an array of personnel to run the programme at the ground level (BLRPs, MTs, community cadres, DMMUs, BMMUs, SMMUs, etc.), and RNGOs who played a critical role in shaping up the project and in its implementation. Convergence with MGNREGS has given a boost to the MUB as demand from communities has increased manifold.

A significant outcome of MUB was the development of capacities of community cadres for implementation, management and monitoring at the community level. This was done through training of trainers (ToTs) and technical support by RNGOs. Key modules were developed on PLA LANN, MUB and livestock development.

The implementation was well planned and as a result, MUB has made significant, positive impact on dietary diversity of target households across all locations visited as part of this documentation process. It has been able to propagate the benefits of cultivating vegetables in the backyard and derive self-sufficiency from it. It has also been able to contribute towards mitigating the additional nutritional challenges posed by the COVID - 19 pandemic. However, the impact is more visible where community understanding on nutrition is high and they have received support for livestock components as well.

The project also incorporated high visibility activities like Pushti Mahotsav which created a buzz about nutritional security across various regions in state. Involvement of all stakeholders, especially PRI representatives, FLWs/AWCs, who along with line departments has created a larger scope for collaboration and coordination to address nutritional challenges.

From the community members' perspective, there is clear evidence of the MUB initiative having a positive impact on their dietary and nutrition requirements. During field visit, it was observed that there is an increase in production of vegetables fruits and poultry among the target households and awareness has been created for greater consumption of home-grown produces.

There are some areas of improvement which could be considered while scaling up the project further.

- Efforts should be made to include the most vulnerable groups and landless households who are currently not getting benefited.
- It is important to plan and stick to the schedule in delivering inputs and services to the target population. For example, delay in seed distribution has negative effects on yield, which further affects the outcome and objective of MUB.

- There is a need to scale up the project and its methodologies for replication in other rural areas. Government, corporates and CSOs could promote these initiatives and strongly consider expansion of the project to address malnutrition issue intensively.
- Many practices like use of *Henna* plant for fencing, day shelter for backyard poultry, etc. have been developed by farmers themselves or promoted by the RNGOs. They need to be identified, developed further, tested and adopted in other areas.
- Community acceptance is a critical factor in the successful implementation of the MUB initiative. It is important to maintain the momentum established by the project, strengthen leadership and functional capabilities from community level to district level.
- Need to create a critical mass of community members as part of community empowerment and capacity building for strengthening rural livelihoods and nutrition improvement.
- A baseline study, especially in the blocks where the MUB initiative is planned to be implemented further will provide a clear starting point of indicators, which will help keep track of progress made and assess the impact at a later stage.
- Conducting a quantitative study of the MUB initiative would help gather more incisive insights into the programme and help significantly in replication.
- ‘Model nutrition gardens’ could be considered as models for national implementation. The expertise of OLM can be used to promote community-driven nutrition gardens in other states and OLM can act as a National Resource Center (NRC).

Annexure 1- Case Studies

Case study 1 - Dhobagudi - Growing Vegetables for Home and Market

Case study 2 – Livestock management and Bokashi, a productivity enhancing animal feed

Case study 3 - Azolla – A viable livestock feed

Case study 4 - Income generation through community nurseries

Case study 5 - Promoting self-reliance in seeds among communities

Case study 6 – Day shelters for backyard poultry

Case study 7 – Using Henna plants for live fencing

Case study 8 - Pramila Barik – An Enthusiastic MUB Farmer

Case study 9 – Budhabari, a community influencer

Case study 10 - Mamta - MUB a blessing during the Covid pandemic

Case study 11 - Dulari Kalo, Krishi Mitra – a passionate learner

Case study 12 - Sasmita Rana – an inspiration for other MUB farmers

Case study 13 - Damayanti Mahakhud – Happy to grow vegetables for grandchildren

Case Study 1: Livestock Management and Bokashi—A Productivity Enhancing Animal Feed

Livestock rearing is an integral part of the livelihood of rural communities in the southern Odisha. Small ruminants and backyard poultry (BYP) are important to communities from cultural, religious and economic perspectives. People rear them for self-consumption, serving guests, and for religious rituals. They are a ready source of money, almost like an ATM, as they can easily be sold from home or at nearby markets to fulfil immediate cash requirements like expenses towards emergency health care, farming, education, marriage, rituals, gifts, etc.

Sana Jamkiheju Village

Sana Jamkiheju is a small village in Champadeipur gram panchayat of Lanjigarh block in Kalahandi district of Odisha. There are 65 HHs in the village of which 50 are STs HHs and 15 are SCs HHs. The literacy level is very low and the major means of livelihood are subsistence agriculture and daily wage labour. The average land holding of each household is around 1.5 acres. Almost all lands in this village are rainfed and hence only one crop is taken in a year. The major crops grown in this village are paddy, maize and cotton. Overall, small and marginal farmers face immense challenges to meet basic needs for survival due to low agricultural output leading to food and nutritional insecurity among the local population.

All households in the village rear goats and BYP in the traditional manner. Despite their large numbers and importance, their productivity is abysmally low due to a number of factors ranging from inadequate attention to vaccination and deworming, improper housing, feed shortage both in quality and quantity and other health constraints.

Livestock Component in MUB

The MUB initiative was initiated in the village during the Kharif season of 2019 to improve dietary diversity of the target groups (adolescent girls, pregnant women, lactating mothers and families having children below 6 years) in the community. As a result, 28 HHs have target groups who have adopted MUB. Establishment of nutrition gardens has increased their access to a much wider variety of vegetables.

The livestock component of MUB is designed to address the need of animal protein in the dietary intake of households and also to increase the household income. This component focused on vaccination, deworming, ethno-veterinary practices of treatment and improved feed practices to enhance productivity by way of adequate weight gain. Along with green fodder, adequate feed supplements are important for proper growth and weight gain of animals. In order to achieve this, Bokashi and Azolla were introduced by the Resource NGO, PRADAN, in this village.

While incorporating the livestock component in MUB, vaccination and deworming of goats was done in the village. These activities prevented diseases and reduced the mortality of goats. Again, in order to increase the quality of feed Bokashi was introduced in the village in 2020 with the support of OLM staff, the veterinary department, and resource personnel from PRADAN.

What is Bokashi?

Bokashi is a Japanese word which means “fermented organic matter.” The Bokashi host medium can be any fine organic grain or grass-like substance — bran, rice, Wheat Mill Run (WMR—a waste product from flour milling), used mushroom growth medium, dried leaves etc.

Bokashi Preparation Method

Preparation of Bokashi involves mixing of paddy husk, wheat crush, maize crush, mustard cake, jaggery and minerals in a specific proportion (as mentioned in the Table-1). This mix results in a high-protein nutrient rich diet for farm animals like goats.

Component	Unit	Quantity	Rate (INR)	Total (INR)
Rice Husk	Kg	3	8	24
Wheat Crush	Kg	2	22	44
Maize Crush	Kg	3	24	72
Mustard Cake	Kg	2	26	52
Jaggery	kg	0.3	45	13
Effective Microorganisms (EM) ²⁹	Litre	0.2	600	120
Water	Litre	2.5	-	-
Cost of 13 kg Bokashi (INR)				325
Cost of 1 kg Bokashi (INR)				25

To prepare 13 kg of Bokashi, mustard cake is soaked in 2 litres of water for 6 hours so that it becomes soft. Then half a litre of jaggery and 200 ml of EM are added to this and mixed well which makes it look like a paste. Generally, rice husk is sieved to collect finer materials (almost similar to rice bran). Then all the ingredients i.e. rice bran, maize crush, and wheat bran are mixed well with the mustard cake slurry. This is stirred well so that the slurry becomes uniform from all sides. Then the entire mixture is kept in an airtight container for a period of 7 days. It takes 7 days for the microbes in EM to be fully activated after which it can be given to animals. While filling the mixture in the container at least 10 percent space is left vacant.

This mix has a shelf life of 6 to 8 months. Goats are fed Bokashi once they return from grazing. They are usually given about 100 grams of Bokashi mixed with water or rice water every day. This was seen to have a positive impact on the growth of goats as they gained significant weight in a short span of time.

Impact of Bokashi – Results of Studies Conducted by PRADAN

Initially, a trial was carried out in the Sana Jamkiheju village with 20 goats from 4 houses which had received regular vaccination and deworming previously. During the experiment it was found that the average weight gain of goats who were fed Bokashi was an additional 3 kg in 2 months as compared to other goats.

The same experiment was carried out later in 6 other locations (Phulbani, Baliguda of Kandhamal District, Ambadola, JK Pur of Rayagada district, Lamptaput, and Nandpur of Koraput district) of south Odisha with similar geographies in a more intensive way for 100 days. Effective Microorganisms (EM) are a major ingredient of Bokashi. Bokashi along with mineral lick³⁰ has shown better results than concentrate with activated EM.

²⁹ The principal microbes present in EM are Lactic Acid Bacteria (*Lactobacillus* spp.), Yeast (*Saccharomyces* spp.), phototrophic Bacteria (*Rhodospseudomonas* spp.). These microbes coexist in liquid culture below a pH of 3.5.

³⁰ Mineral lick is a mix of essential mineral nutrients for animals.

- In Nandapur, goats that were 3-to-5-months old got an additional weight gain of 1.6 kg per goat as compared to the non-treated goats in a period of 40 days.
- In pregnant and lactating goats in Ambadola, 1.9 kg of additional weight gain was observed per goat as compared to the non-treated goats in a period of 40 days. Similarly, in J K Pur, 5.1 kg of additional weight gain per goat was observed as compared to the non-treated goats in a period of 40 days.
- In case of castrated goats in Baliguda, 8.9 kg of additional weight gain was observed when compared to the non-treated goats in a period of 100 days.

During meetings with SHG members, they stated, “Livestock mortality has reduced due to regular vaccination and deworming. Production from livestock has increased due to better diet. Households have adopted new methods like Bokashi which is used as a livestock feed supplement.”

Bokashi—An Income Generating Activity Taken by SHG

With this positive experience of Bokashi feed, one SHG prepared Bokashi in bulk (10 quintals). Cost of production including labour was INR 35/kg. It was sold to farmers at a rate of INR 50/kg.

Goats hold tremendous potential in rural areas under changing agro-climatic conditions and depleting resources for crop-based livelihoods. Inadequate nutrition compromises with animal productivity. Bokashi hence, is a promising feed supplement. This seems to be a feasible income-generating activity being promoted by the Resource NGO, PRADAN, which enabled the SHG to be geared up for Bokashi production.

Table 2 – Cost Dynamics for Production of 1000 kg of Bokashi

Particulars	Unit	Quantity	Rate (INR)	Total (INR)
1000 kg Bokashi	kg	1000	25	25,000
Preparation charges	person days	8 labour for 4 days	250	8,000
Polythene	per piece	230	2	460
Marketing time	person days	2 people for 2 days	300	1200
Misc. expenses				340
	Total Cost			35,000
	Cost / kg			35
	Profit / kg			15
	Selling price / kg			50
	Total revenue (INR)			50,000
	Total profit (INR)			15,000
	Unseen loss (INR)			1,000
	Net profit (INR)			14,000

Lessons Learned

- Vaccination and deworming of goats are important to prevent diseases and improve production.
- Hygienic living conditions need to be maintained to keep the farm animals free of parasitic infestations. Some goats suffered from diarrhoea for a prolonged period between the experimentation time during which they did not consume the provided feed. Proper maintenance of the shed and cleanliness has been an important factor in variance in the growth of goats.
- Overcrowding and lack of ventilated areas which have neither light nor air have a detrimental impact on the health of animals as well as their growth.

- Provision of adequate dry fodder and green fodder is a must along with supplements for maximum growth.
- Bokashi is a low-cost feed which can be prepared by HHs or SHGs or any entrepreneur and it has good potential to increase the weight of goats and bucks and possibly for other ruminants.

Case Study 2: Azolla – A Viable Livestock Feed

Animal source foods contribute significantly to the dietary diversity of humans. The inclusion of livestock as a key component in MUB is to address multiple micronutrient inadequacies among the target population. Initially, the livestock development activities as part of MUB focused on deworming and vaccination of goats and BYPs in the designated villages. In order to address shortage of dry fodder, green fodder and concentrate, alternatives like Azolla cultivation have been introduced in some locations by the RNGOs as a livestock feed.

What is Azolla?

Azolla, an aquatic fern, mostly utilized as bio- fertilizer for wetland paddy. It has a rapid biomass production rate and is high in protein, essential amino acids, vitamins, and minerals. Because of this, promotion of azolla as a livestock feed has been increasing as a valuable protein supplement for many species, including cattle, ruminants, poultry, pigs and fish.

Considering the positive association between animal protein and dietary quality, and the resultant nutrition and potential improvement in health status of the target group, Azolla cultivation was introduced in a few villages of districts like Sundargarh and Kalahandi in July 2020 by Harsha Trust and PRADAN. The resource persons from the RNGOs explain that Azolla is a highly beneficial livestock feed which can be grown quite easily in the backyard of households.

Azolla Cultivation Method

The process followed for Azolla cultivation is to make small shallow pits (6 ft x 4 ft x 1 ft depth), placing a polythene sheet in the pit to form a base and pouring slurry (made of 2 kg dry cow dung, 1 kg sand and ½ kg ash) on the sheet. Water is added to a height of about 6 inches. About 0.5 – 1 kg of pure mother Azolla culture seed material is spread uniformly over the water and the Azolla bed is stirred mildly. Fresh water is sprinkled over the Azolla immediately after inoculation to make the Azolla plants stand upright.

Azolla cultivation is done by farmers with their own contribution in terms of labour and material (cost of polythene is about INR 100/-). The first yield of 2-3 kgs is usually harvested after 15 days as Azolla grows quickly. Thereafter, the 2-3 kgs of harvest is done once every week. Around 0.5 kg of ash and 1 kg of dry cow dung is added once in 10 days in order to maintain rapid multiplication of Azolla and a daily yield of 500 g. About 5 kg of bed soil is replaced with fresh soil once in 30 days to avoid nitrogen build up and prevent micronutrient deficiency. 25 to 30 percent of the water also needs to be replaced with fresh water, once in every 10 days to prevent nitrogen build up in the bed. The bed is cleaned, the water and soil replaced and new Azolla inoculated once in every six months. Whenever yellowish growth is seen in the plants, they are removed from the pit. Azolla has a distinctive smell of cow dung which is removed by rinsing it in fresh water 2-3 times before feeding it to the livestock.

Use of Azolla in MUB

Azolla is used as feed for poultry and goats. It is given in fresh or dry forms. Usually, the surplus stock is sun-dried, washed and given to animals. It is mixed with regular feed as well.

A few farmers in Sundargarh district used Azolla as livestock feed and got encouraging results. By feeding it to the BYP, increase in bird growth as well as egg quality and production were observed. Goats gained weight faster when fed with Azolla. Being a low-cost product, it helps households save expenses on feed which they would have spent on buying from the local market otherwise.

Madhuri and Gowri, PMs in Sana Jamkiheju village mentioned, “There is a shortage of green fodder in this area especially during summers and so we introduced Azolla as an alternative feed for goats and BYP. Last year, animals did not like the taste of Azolla but this year, we did a different variety and the animals have taken to it much better.”

It is to be noted that animals do not like some varieties of Azolla. In 2020, Azolla harvesting was done by PRADAN in a few villages in Kalahandi district through convergence with the Agricultural Technology Management Agency (ATMA)³¹. However, animals did not eat it. But this year, the Azolla produced in Odisha University of Agriculture and Technology (OUAT) was procured and given to animals which they consumed without any issues. Efforts are being made by OLM and RNGOs to make more farmers aware about the benefits of Azolla.

Rinki Nayak, PM of Beguniapada village says, “Azolla was introduced in our village with the support of the Directorate of Animal Husbandry and Veterinary Services. It is consumed by all animals in the village including goats, cows and BYP. Azolla is given both in the raw form as well as in the cleaned and dried form. Sometimes, animals may not like the smell of the dry feed and so we mix it with rice water and make it into a gruel, which is easily consumed by the animals.”

Lessons Learned

1. Azolla is a low-cost input for BYP and goats
2. It can be easily prepared by HHs or SHGs
3. In the MGNREGS model there is a water tank along with the nutrition garden. This can be used as a pond for propagation of Azolla.

Case Study 3: Income Generation through Community Nurseries

Butiguda Colony is a small rustic tribal village with 55 HHs in the Rasabeda Gram Panchayat of Khairput in Malkangiri district. Before the introduction of MUB, consumption of vegetables among tribal families in the village was negligible and that was clearly visible in their health status. Malkangiri has the highest percentage of malnourished children in Odisha. MUB was implemented by OLM in this area through women SHGs in the Kharif season of 2019. The SHG women in the village were enthusiastic about the project as it provided them access to a variety of vegetables.

Quality saplings are essential for establishing MUBs. OLM came up with the idea of developing nurseries at the community level to enable nurturing of vegetable and fruit saplings to meet the requirement of the local farmers. Hence, the BLRPs discussed the setting up of such nurseries with the SHG women. The idea of raising a community nursery appealed to women of Matrushakti SHG as a new avenue for income generation. Community nursery development helps in sharing of risks,

³¹ ATMA is a registered society responsible for technology dissemination at the district level. It is a focal point for integrating research extension and marketing.

investments, labor and responsibilities, thereby reducing the burden on any individual. The plan was for select SHG members to collectively develop community nurseries in their village to meet the requirements of their own village and wherever possible, meet the needs of the neighbouring villages or gram panchayats. OLM had a provision to support SHGs to start a community nursery and a specific loan or grant amount could be made available under this support.

Training in nursery raising by the Department of Horticulture and handholding supports was provided by the Krishi Mitra and BLRP of Harsha Trust. This support built confidence among SHG women to raise a nursery in their area. The training also included management of slightly improved technologies like solarization, grafting and marketing of seedlings and saplings.

With all the support, Matrushakti SHG members started raising the community nursery with their own money. They choose a location near a pond to ensure steady availability of water. They bought seeds of drumstick and papaya from Nabarangpur town. Though the survival rate of seeds was slightly more than 60%, they were able to get a good income by selling the saplings to other MUB farmers, as described in the table below.

Name of Seedling	Seeds Sown	Saplings Survived	Saplings sold	Rate/sapling (INR)	Revenue (INR)
Drumstick	7500	4500	4350	15	65,250
Papaya	8000	5300	5200	15	78,000
	15,500	9800	9550	30	143,250

Total expenses incurred was INR 65,300 while they were able to sell saplings for a total of INR 143,250, which meant a profit of INR 77,950. Encouraged by this success, the women got motivated to continue nursery raising. Lack of water was an issue and hence they plan to do it only during kharif season.

Gradually, 584 SHGs expressed their interest in starting community nurseries for papaya and drumstick saplings. 480 SHGs were able to commence after getting the requisite training support by the RNGO or Department of Horticulture. Officials, however, found that due to lack of handholding support by either community cadres or BLRPs, many of these community nurseries could not generate profits. Despite this, the work done by Matrushakti SHG is a good example which can be replicated.

Lessons Learned

Proper training and handholding support is very important for community nurseries to be successful. It is also essential to develop a business perspective among the SHGs to keep track of expenses and income, and make strategies to be profitable.

Case Study 4: Promoting Self-reliance in Seeds among Communities

Good seeds make a good crop and a farmer knows this best. In the context of MUB, open-pollinated varieties were provided to women farmers as they could be saved for future planting, reducing the need to buy seeds year after year. Traditionally, seeds are conserved by farmers and they also exchange it among their community members. Individual farmers used to save and store seeds of their own selection of plant varieties for future use. Now they do it collectively through SHGs.

In Rayagada block of Gajapati district, 110 SHGs from 30 villages, and 59 SHGs in Nuagada block are preserving vegetable seeds since the Rabi season of 2019. This initiative was promoted by Living Farm to provide easy access to quality seeds of diverse crop species to the local community.

Guidance on selection of vegetables/plants from a seed selection perspective, harvesting time and storage techniques were provided to the SHG members. Living Farm provided inputs on how to select high quality seeds, and how to clean, dry and store seeds. For example, the best vegetables of plants which have good growth and no deformities are saved for collection of their seeds. The vegetables/fruits are harvested when seeds are mature or ripe enough and when they are dried sufficiently. Then these seeds are kept in paper envelopes with labels and stored in earthen pots. There are variations in drying methods for different vegetables. Some are dried directly (like pumpkin, ridge gourd, etc.) whereas seeds of vegetables like tomato, cucumber, etc. are covered with wood ash and then dried. The earthen pots are usually kept in the house of the president or secretary of the SHG.

Earlier the groups saved only 3 varieties of seeds i.e., those of bottle gourd, pumpkin and ridge gourd. Now they save about 10 varieties of seeds. They understand the need of seed conservation which helps enhance access to good quality seeds and reduce external dependency of the community for seeds. As the groups get enough seeds from OLM, they have not used the seeds saved by themselves. They say that those seeds are for usage in emergencies. However, they do share the seeds with other community members and relatives.

The SHGs use improved methods to conserve seeds and it has been a good start for them. However, they need more inputs on individual selection processes and handling skills to improve the quality of seeds at their disposal. They are not yet confident of saving seeds of all the vegetable varieties they receive from OLM. They also need to maintain a database and record of seeds in a proper way. They have started off well in moving towards improved ways of seed preservation. Institutionalization of this process over time will lead to communities becoming self-reliant in terms of seeds.

Lessons Learned

1. Seed preservation is a new activity and appropriate training needs to be given to KMs and master trainers, so that identification, collection and preservation of seeds can be practiced in a more scientific manner.
2. Seed preservation enables communities to be prepared for future disasters and scientific ways of preserving seeds in the right place by using the right storage equipment is the way forward to empower communities.

Case Study 5: Day Shelters for Backyard Poultry

Backyard poultry is a component of MUB and can be a significant contributor to dietary diversity for rural households. However, in households where nutrition gardens and BYP co-exist, there is a need to protect nutrition gardens from poultry. There is also the need to ensure that poultry is protected from external predators especially when people of the household go out of their homes during the day to work in their fields.

When this issue was brought up by community members, with the dual objectives of keeping both MUB and poultry safe, the RINGO, PRADAN, initiated setting up day shelters for BYP.

Earlier, the practice was to keep these birds in small shelters during the night, which essentially are small with about 1 sq ft of space per bird. While this enclosure is enough for birds during night, they need more space to move around during the day. This was addressed with the help of day shelters that are enclosures with around 5 sq.ft. of space per bird, right outside of the homes. These enclosures are made of plastic nets and locally available wooden support columns. It can also be covered from the top to dissuade aerial predators like kites. Inside the day shelter, people keep food and water for the

poultry birds and this basic arrangement is enough to protect birds from predators and also prevents birds from wandering into the nutrition garden and damaging plants or seeds. This costs around INR 1500 for material and installation including INR 100 to be paid to the Prani Mitra for overseeing the entire process of installation. Nets are bought in bulk to reduce costs.

A pilot was done by the PRADAN team in 5 locations in Baliguda block of Kandhamal district and after seeing positive results, the concept was expanded to other locations and are operational since past one year. As on date, about 700 such day shelters have been built by the farmers and it has helped in preventing assets from loss as envisaged.

Lessons Learned

1. Day-shelter is a good strategy to keep poultry along with nutrition gardens and can be replicated as it is easy to make and is cost effective.
2. Day-shelter works like an insurance or a preventive mechanism to safeguard poultry from predators to a large extent.

Case Study 6: Using Henna Plants for Live Fencing

During interaction with various stakeholders as a part of this documentation process, an innovation was learned in Barada village of Chikiti block in Ganjam district. Barada is part of Rampa gram panchayat. The village has 290 households of which 209 households have nutrition gardens. There are 17 Badatiya families in the village who have traditionally been commercial vegetable growers. They were mostly cultivating leafy vegetables like spinach, coriander, etc. and selling them in the nearby villages. In addition to their regular cultivation, they adopted MUB to focus on nutrition for their families and also to sell surplus production.

Earlier the Badatiya families used to make fences using bamboo bush branches to protect their farms which were not very durable and lasted for only a few months. Getting bamboo for replacing damaged ones was expensive and a laborious task. Around 3 years ago, they started replacing the bamboo fence with Henna plants. The terrain was not very fertile and hence it took a few months for the Henna plants to grow. All their lands are now fenced with Henna plants. Henna plants have multiple uses. First, Henna plants are woody, tough, non-browsing and because they can form a thick vegetation, it makes for a good fence and a formidable barrier against animals and people. Second, Henna plants do not need much water and hence suits the general dry and water-scarce environment around the area. Third, it is eco-friendly and cost effective when compared to any other fence. It also helps to save expenses which otherwise would have been incurred in putting up a fence every year. Fourth, Henna as a natural dye is used to dye hands, feet and hair. It also has social acceptance due to its association with festivities and personal beauty. Lastly, Henna is used in many Ayurvedic and Unani medicines, for both humans and animals.

Mami Badatiya, a MUB farmer says, “Henna leaves have good demand. People buy Henna leaves from us during marriages and the first puberty ceremony of girls. Henna plants are also in demand because of their medicinal uses.” Mami Badatiya’s family is able to earn some money during a year by selling Henna leaves from home. Using organically grown Henna plants as a bio-fence is indeed a sustainable practice which is environment-friendly and economically advantageous.

Farmers of Rampa village have shown a new way of earning money from fences by using the plant as a low-cost green fencing material. Also use of Henna plant, which has cosmetic and medicinal value,

has increased its acceptability.

Case Study 7 : Pramila Barik – An Enthusiastic MUB Farmer

Pramila Barik is an SHG member based in Tungurbahal village in Telkoi block of Keonjhar district. She is in her fifties and lives with her husband, 2 sons, daughters-in-law and 3 grandchildren. They own a barber shop which is also their traditional family business. They also own an acre of farmland where they grow paddy which earns them an income of around INR 20,000/- annually. They have a small patch of land of around 6 *decimals* around their house.

Situation before the project started

Pramila says, “Earlier our backyard was mostly vacant and only a few types of vegetables like brinjal and okra were grown, but production was not very good. We did not know the process of cultivation properly. We were dependent on the local *haat* (weekly market) for purchasing and selling vegetables. We were not eating many vegetables either. Vegetables like carrots were expensive and we did not include them in our diet. Coriander leaves were not available all the time. Vegetables were bought once a week and hence were not freshly consumed.” Pramila’s family also reared goats and poultry in a traditional manner.

Support received as part of the MUB programmeMUB initiative

When Pramila got to know about MUB from Krishi Mitra, she was interested as she was getting seeds for free and the necessary technical support to develop the nutrition garden.

She started MUB in October 2019. She says, “The most important part was that we learnt the entire process right from land preparation (which includes how to make a layout, prepare beds, etc.) to organic manure preparation and application, organic ways of pest management, seed treatment and plantation, nursery preparation and planting of sampling among others.”

Changes experienced by beneficiary – the impact

Pramila says that because of MUB, people’s access to a variety of vegetables has increased substantially and simultaneously their knowledge on best utilization of land and organic farming techniques have also grown. “Earlier, just about 4-5 types of vegetables were grown and not in a systematic manner. Now we grow about 14 types of vegetables and I feel very happy about it. We do not buy much vegetables from the market as there are enough vegetables in our nutrition garden. We were not getting such good quality brinjals, chilies, tomatoes from the market. Since vegetables were expensive to buy, the quantity bought used to be less. Now people are able to get enough vegetables for their own consumption. Previously malnutrition was rampant among children in my village. But now, post the introduction of MUB, we see a marked reduction in this.”

Her knowledge on rearing livestock and BYP also increased as a result of this programme. She ensures that the animals are vaccinated and dewormed regularly with the support of the Prani Mitra. She gives



nutrient-rich feed like Azolla to the animals.

Pramila has a very good understanding of MUB, nutrition and WASH. There is a compost pit in her nutrition garden. She puts household green waste like vegetable peels, dry leaves, etc. She does not use any chemical fertilizers or pesticides which means there is no harm to the land or to the produce.

She says that the PLA-LANN meeting at SHG made her realize that the right nutrition is very important to lead a healthy life. The entire community now also has a much better understanding of health and nutrition especially for their children. Earlier when AWW used to weigh children, the community members used to scold them and question their intent as they didn't think it was necessary. They were of the opinion that their children are fine even though they were under-nourished. But now there is a behavioural change in the community and they are more than happy to go to the AWC and ask for their children to be weighed because now they believe that this is an indicator of good health and nutrition.

Pramila does not sell the vegetables she produces and uses it for her family's consumption. She believes it is a much healthier option. Impressed by the benefits of MUB, she has also written an educational poem on health and nutrition.



Pramila at her nutrition garden

Though her MUB experience has been good, there are still some challenges which need to be addressed. Availability of water throughout the year, especially during summers is a concern. Though there is a makeshift fence around her nutrition garden, she needs a pucca fence to keep animals away. She is also waiting for her wages as part of MGNREGS which she wants to use to build a proper fence.

Pramila is an ardent advocate of MUB. She is convinced of its benefits. In order to have sustainable operations, she has started retaining seeds so that she can continue even if she does not get seeds from Krushi Mitra.

Case Study 8: Dhobagudi - Growing Vegetables for Home and Market

Dhobagudi is a remote village in Kumdabali gram panchayat of Muniguda block in Rayagada district. Subsistence agriculture, animal husbandry, daily wage labour and NTFPs were the main sources of income for 73 HHs residing in this village. Few years back, this tribal dominated village did not get enough food throughout the year. Agriculture was rain-fed in the absence of irrigation facilities. Fast depleting forests posed a threat to their sustenance. Mortality rate was high for livestock and it was not remunerative.

OLM has been working in Dhobagudi since 2014 through women's SHGs. There are 7 SHGs in the village. The SHG women are very active. The Maa Kalyani SHG has taken up the contract to provide mid-day meals to the local government school. They also make bricks which are used for rural housing schemes. However, for the past two years Dhobagudi has made a good name for itself in vegetable cultivation. This has happened due to concerted efforts by OLM, its partner RNGOs and other line departments.

The village community members were made aware of the MUB concept by Krishi Mitras, the key aspect being that production was meant mainly for family's self-consumption with the long-term goal of achieving nutrition enhancement. Capacity building activities, field level demonstrations and handholding support provided by the community cadres encouraged community members to take up nutrition gardens. A total of 20 households have set up nutrition gardens and have been producing vegetables for the past 2 years. With the advent of MUB, the farmers commenced cultivation of a larger variety of vegetables for self-consumption and nutrition. Draupadi Pidikaka is a tribal girl from Dhobagudi studying for her graduation in Muniguda. She says, "Post MUB, my family does not have to go to the local market to buy vegetables because of its availability in our backyard." Her mother Anjana Pidikaka is a progressive farmer and grows high quality vegetable seedlings in a poly-house nursery, which is bought by people in the village. She is supported by the Harsha Trust as part of APC programme. Selco Foundation³² chipped in with solar operated pumps while sprinklers were provided by the Department of Horticulture.

In this village landless households were also supported for livestock development. Shubhakanti Bidika, a resident of the village, said, "Some households do not have land to grow vegetables. In such cases, people who have cultivated vegetables, give a share of their produce to them."

The local AWW, Jamuna Sikaka, also grows vegetables for the 22 children who attend the *anganwadi*. She says, "Earlier there used to be more children in yellow and red nutritional zones. There are only 4 children in the yellow zone now. I give 3 to 4 types of vegetables to children every day."

In addition, OLM and its partner RNGOs have worked with the local community to raise awareness and provide relevant information about economic opportunities associated with nutrition gardens and nurseries.

Farmers in this village used to cultivate paddy, millets, black gram, horse gram, etc. earlier mainly for self-consumption. However, in the past few years, the cultivation was diversified to include vegetables to sell in the local markets. Earlier, lack of irrigation facilities did not allow them to continue cultivation round the year and the situation was worse in non-rainy months. The Department of Horticulture provided solar powered irrigation facilities from the nearby Bansadhara river, which was a major catalyst for the farmers in boosting productivity. Now, the production is good as the farmers have a good source of water and they use organic compost that is prepared in compost pits. The Department of Agriculture also came forward to assist them and provided good quality seeds and training to enable them to have higher productivity by using improved methods. Shanti Sikaka, who is from Dhobagudi, is the Director, Dharani Penu Farmer Producers Group. She says that vegetable cultivation has caught on so well that it keeps them occupied completely. They have also learned additional aspects like nursery raising, preparation and application of organic manure by using cow dung and vermicompost, and growing new types of vegetables like capsicum and broccoli which have good market value. They usually sell their produce in the Muniguda local market where their produces have good demand.

³² Selco Foundation is a Bangalore-based NGO which helps communities by promoting the usage of sustainable energy

Sometimes the wholesalers also come to the village to buy the produce from the farmers.

Sabita, working as CRP, says, “People used to apply fresh cow dung manure directly to the plants. They understood that composted cow manure is much more beneficial. The community members have seen a sizable increase in their incomes due to vegetable cultivation. Some people have sold chilies and earned INR 20,000 in one season.”

The MUB initiative in Dhobagudi is a good example of convergence of various development programmes by the Government, and non-government and corporate partners, which has worked wonders for the community. With its introduction along with the Agricultural Production Centre (APC), there is a sea change in the scenario now. The SHG women now grow organic vegetables for self-consumption as well as for selling at the local market. Vegetable cultivation has made a significant difference to livelihoods of poor households with minimal land requirements and capital outlay by providing access to food and establishing an income base.

The residents of Dhobagudi have done very well to embrace vegetable cultivation with the support received by various organizations. The creation of the vegetable trade offered an opportunity for the community members to improve their livelihoods considerably. Their efforts yielded good results motivating them to continue and improvise further to enhance their incomes and nutrition standards. Such interventions also act as an incentive for rural inhabitants to remain in rural areas and not migrate to urban centres.

Case Study 9: Budhabari—A Community Influencer

Tishaguda village which is part of Umerkote block in Nabarangpur district has set an example by having the maximum households in any village in the state which has developed backyard nutrition gardens. Budhabari, a member of the women’s SHG played a key role in inspiring others to follow her success with MUB.

She got an opportunity to be a part of the MUB initiative along with other 53 households in the village. Harsha Trust, the RNGO took an active role in supporting the BMMU for selection of targeted beneficiaries, nurturing the cadres of OLM for smooth roll out of the programme. Gancha Kalar, the Krishi Mitra kept interacting with the beneficiaries of the village for need-based interventions at regular intervals.

Budhabari had followed the MUB prototype and was able to cultivate different vegetables like leafy greens, pumpkin, bottle gourd, ridge gourd, bitter melon, cowpea, cucumber, etc. She also learnt to prepare *Handi Khata*, neem extracts for pest management and liquid manure for nutrient management. While most of the community members were unable to have vegetables as part of their diet during the Covid-19 lockdown period, Budhabari and her family managed to have different vegetables in their regular diet.

The efforts of Budhabari blossomed into a steady supply of organically grown vegetables which in turn keeps the family healthy and reduces household expenses. Budhabari not only established the nutrition garden but also inspired other SHG members to have the nutrition gardens in their backyards.

Case Study 10: MUB - A Blessing During COVID-19

Mamta lives in a joint family with her daughter, husband and two brothers of her husband. Her husband is a driver for the local school vehicle but has been out of a job due to Covid-19 related shutdowns.

In the first year, Mamta had opted for MUB's gunny bag model as they did not have much land near their house. In the year 2020, during an SHG meeting, she learnt that work on nutrition gardens would be eligible for payments under MGNREGS. The onset of Covid-19 and related lockdowns made matters difficult for her family as savings dried up and there was no source of income. In order to secure the supply of vegetables for her home, she decided to set up a MUB on a nearby farm land which was earlier used for paddy cultivation.

The KM helped her a lot in establishing the MUB. The KM demonstrated how to make the layouts and prepare nutrition garden beds appropriately. Mamta along with her husband and other family members made the nutrition garden bed. The KM explained in detail how the seeds were to be planted. She even demonstrated how sowing needs to be done. According to the DPM, "Earlier the farmers used to complain that the number of seeds provided was too less, but when they learned this new way of sowing, they found out that the seeds provided were sufficient for a good crop. Instead of the traditional way of scattering the seeds on ploughed land, they learned to plant seeds individually by maintaining proper distance. This has led to a much better production of the crops."

They had a good production of leafy vegetables and coriander which was more than enough for the 9-member family. There was a good production of pumpkins also. The good thing about pumpkins is that they have a long shelf life and do not deteriorate quickly. It can be stored for long periods of time without getting damaged. The BLRP from Living Farm who had provided training to the KMs and was involved in monitoring the nutrition garden was very happy with the way MUB has been developed by Mamta and her family.

In addition to vegetables, the family also planted maize, fenugreek and coriander. These grew very well and Mamta's family was happy with the result. Everything was grown organically. The KM had taught them how to make Agneyastra, handi khatta, etc. and how to use them. This saved money as they didn't have to spend on fertilizers and pesticides and were able to get chemical-free vegetables.

Mamta was happy that the family was not buying vegetables from the market except potatoes, onions, garlic, and ginger. She said, "We have a large family and are able to grow a good variety of vegetables right here in our nutrition garden without spending a lot of money as earlier, especially during the current Covid situation. Earlier, we used to buy vegetables from the local *haats* twice a week. We used to spend around INR 400 per visit to the market for vegetables. Now this has halved and the spend is less than INR 200. Every week, we save about INR 400 which means monthly savings is around INR 1600. The MUB really helped us during the Covid pandemic by ensuring regular supply of vegetables."

In spite of all the benefits, Mamta's family face an issue of monkeys destroying their crops. They have installed nylon nets to control this problem. She bought nets using the money she received as part of MGNREGS.

Overall, Mamta says that she is happy with the twin advantage of receiving monetary benefits from the government and being able to grow vegetables in her own garden. All the family members help in maintaining the MUB and she is glad that she undertook the MUB initiative.

Case Study 11: Dulari Kalo, Krishi Mitra – A Passionate Learner

Dulari Kalo is a 55-year-old woman farmer from Bandhapali village of Mahulpali GP of Tangarpali block in Sundargarh District. She lives with her husband and two children. Dulari is a member of the Tulasi SHG since 2010 and she also works as a Krishi Mitra (KM) in Mahulpali GPLF since 2018. Her husband Ganesh Kalo, 58, works in the district horticulture nursery as a wage labourer. Their son who is 26 years

old was able to study only till Class 12 and their daughter, 17, has studied till Class 10. They could not send their children for further studies due to their poor financial condition.

Dulari was part of the MUB orientation programme held for community cadres at Tangaprali in April 2019. Being a Krushi Mitra, she was very interested in adopting the concept as she felt that this programme could really help the people of the village reduce family expenses on vegetables while allowing them to have a much better nutrition intake. The nutrition garden demonstration was carried out in her backyard in around 3 *dismils* (1300 sq.ft. appx.) of land.

Dulari says, “Earlier I used to grow onions and some potatoes in my land. These were used mainly for family consumption.” As part of the MUB, she prepared a rectangular bed and learned how to make layouts, seed treatment, seed sowing, crop planning, organic manure and pesticide preparation, seed preservation, etc. She also underwent PLA-LANN and livestock management training. As part of the programme, she received indigenous seeds for all seasons, fruit plants, rose cane, etc. She grows vegetables throughout the year. She has a well in her backyard which provides adequate supply of water to the nutrition garden.

In approximately 2 years since Dulari started the MUB, she has worked hard to make it a successful venture. She has grown 17 types of vegetables and makes organic manure through composting. She does mulching in the nutrition garden and has planted flowers as pest repellents. She preserves seeds for the next cycle. In the pre-MUB scenario, her family had to buy almost every vegetable from the local markets. The situation is very different now and she only buys from the market sporadically. She has enough vegetables like tomatoes and brinjals which her family used to buy earlier. She is also able to have new vegetables like *palak* which was not part of the diet earlier. Dulari has a poultry unit for which the shed was constructed as part of MGNREGS convergence. She gives nutrient-rich feed like Azola, Termite, etc. and clean water to the birds for their proper growth and high production. Timely vaccination and deworming keep the birds healthy. In addition to generating extra income, the poultry unit also provides eggs and meat for family consumption.

Dulari is a keen learner. She tries to understand new ideas and interventions and adopt them. Since she is a Krishi Mitra, she also has the additional responsibility to maintain the MUB well as an example for others. Dulari’s communication skills and understanding of this programme is exemplary. As a result of her hard work and dedication 20 farmers in the village were motivated to start their own nutrition gardens. She works dedicatedly to share knowledge and provide handholding support to the nutrition garden farmers. She says, “The MUB initiative has increased diversity in our diets significantly. We now have good knowledge of organic farming and the role of nutrition in the physical and mental development of people. We will continue to innovate more and spread the word for others to lead healthier lives”.

Case Study 12: Sasmita Rana – An Inspiration for Other MUB Farmers

Sasmita Rana is part of the Maa Gayatri SHG in Dum Karla Khunta village of Phatamunda panchayat. Post MUB training, she set up a nutrition garden on 3 *dismils* (1300 sq.ft. appx.) of land in October 2020. She has a rectangular MUB with 7 beds and additional structures for water storage and composting.

She continued with the MUB for two seasons, Kharif and Rabi. She says, “Earlier we did not grow anything in this patch of land. Now, we grow vegetables here, as wage support from MGNREGS, seeds, saplings and necessary guidance from OLM are provided.”

She continues, “We were given 17 types of seeds and 6 fruit saplings. About 70% of the seeds sown germinated. This included bottle guard, bitter gourd and greens (*saag*) which had good germination. After harvesting radish, we bought seeds on our own and sowed it again to get a fresh crop. We still have 14 types of vegetables in our nutrition garden.”

Elaborating on the benefits of MUB, Sasmita says, “We are able to consume better quality and variety of food ever since we started harvesting five months back. MUB is designed to get small but continuous and regular harvests. Earlier we used to buy all vegetables from the market but now due to MUB we don’t need to. The MUB provides enough vegetables to feed our family of five. We are able to grow vegetables using organic compost, liquid manure, etc. which is good for our health and nutrition.”

Till now, her family has been able to harvest brinjals, tomatoes, chilies, *kalam saag*, *bhai saag* (*local varieties of greens*), carrots, coriander, beans, onion, , radish, spinach (*poi saag*), bottle gourd, bitter gourd, etc. Her husband participates actively in tending the garden. They also learned to expand their diet. Earlier *poi saag* was not part of their diet. Post MUB, she learned how to cook it and everyone in the family liked it. She always gets a good yield of bottle gourd, bitter gourd and tomatoes. She gives all credit to organic fertilizers. She says, “We apply only *khat* (organic compost), no *saar* (chemical fertilizers).”

Availability of water is a concern especially during summer. The BLRP from Living Farms says that water gets evaporated quickly if they just pour it in the traditional manner, and the plants do not get to absorb the required amount of water. To use water more efficiently, in a 20 ft bed, 4-5 pots or 2 litre bottles with small holes are placed. Farmers put water in the pot so that it drips slowly into the soil. This method ensures better utilization of water and absorption by the plants. Lack of availability of water is a big challenge and Sasmita has been requesting for digging a well in her backyard as part of the MNREGA scheme. Apart from vegetable production, Sasmita is also very aware about the deworming and vaccination process of her livestock. She has 10 hens and 5 goats and got them dewormed and vaccinated in time.

Phatamunda is a new Gram Panchayat under Mission Samridhi and the process of recruiting community cadres is still on. Hence, till now PLA-LANN modules have not been covered in the SHG which Sasmita is part of. However, her understanding on health and nutrition is good aided by interactions with the BLRP. Sasmita is a source of motivation to other households in the village. On seeing her nutrition garden, many other beneficiaries were motivated to start the same.

Case Study 13: Damayanti – Happy to Grow Vegetables for Grandchildren

Damayanti Mahakud is a resident of Mahulpada village in Pandakamal gram panchayat of Kalahandi district. She is a member of the Maa Laxmi SHG. She is in her fifties and has a five-member family including two grandchildren. She is the head of the family and farming and agricultural labour is the main source of income for her family.

She established a rectangular nutrition garden in October 2020 in 3 *decimals* of land in the backyard of her home. They use water from hand pumps to irrigate the plants. During summers, it is difficult to get water which results in lean production. Seeds for the nutrition garden were provided by OLM. The germination rate of seeds was over 80% and this resulted in a steady production of vegetables. Currently, 13 varieties of vegetables are grown in her nutrition garden. This includes okra, spinach (*saag*), coriander, beans, tomatoes, ridge gourd, among others. Inputs received by Damayanti as part of this project include seeds, saplings and training on how to make a nutrition garden, preparation of

organic manure and pesticides.

Damayanti says, “In the Covid-19 lockdown phase, our regular work had come to a standstill. During that time, we were contacted by the CRPs and KM and they asked us to start a nutrition garden. They said that they would provide the necessary seeds and would help in preparing nutrition garden beds. This would help us become self-reliant and not be dependent on the market for buying vegetables. We agreed and commenced work on the nutrition garden and this proved to be a real blessing. They provided us with all the necessary inputs. We started growing all types of vegetables and this really helped us save our hard-earned money and provided us with a healthy crop. The money we saved was used to repay bank loans or deposited with the SHG which further helps us. This has been a very helpful initiative especially during the tough days of lockdown when we had very little income. We were also able to help others by giving them some of the produce. My grandchildren also help me tend to the nutrition garden. They like watering the plants.”

Jhili kumari Gouda, who is also a member of the Maa Laxmi SHG from the same village, said, “In our village, there are people of differing socio-economic standing. Some of us are very poor and cannot afford to buy and consume multiple types of vegetables. Such families had to manage with one or two vegetables per day irrespective of there being a pregnant or lactating mother or not. Poor families also did not have enough purchasing power to buy pricier vegetables like carrots. Due to the nutrition garden, everyone was able to get more vegetables than they did earlier. Due to MUB, they are now able to grow such produce themselves and are able to have more nutritious food. This initiative has also brought about some sense of equality amongst the village community at least in terms of nutrition and diet.”

PLA-LANN has been conducted in the village till module 4. Discussions during the PLA-LANN exercise helped Damayanti have a better understanding of the importance of nutrition. She understood that the main objective of this intervention is to improve nutrition levels of the community and she resolved to proceed with establishing a nutrition garden. New vegetables grown include beetroots, carrots, fenugreek, spinach, etc. These vegetables are also not easily available in the market. There are some vegetables like bottle gourd which are commonly used but were not available at all times. Due to MUB, these could be produced in nutrition gardens.

Damayanti also has livestock – 9 hens and 6 goats – to augment the family income and diet. As per prescribed best practices in MUB, she has learned to prepare feed supplements for her animals. She also knows about ethno-veterinary practices.

One of the major challenges Damayanti faces is scarcity of water. In addition, the quality of water is not good as there is no source of water nearby in the village. Damayanti’s family depends on hand pump water that is hard mineral-laden. There is a river nearby (Utei river) but it is not yet tapped for supplying water to the village.

Annexure 3 – List of Participants Interacted & FGDs Conducted

List of participants Interacted During Data Collection for the Documentation

SL. No.	Place/District	Name of the Participant	Designation/Organization
1.	Bhubaneswar	Debasis Mohapatra	SPM, OLM, State Nutrition Cell
2.	Bhubaneswar	Phalguni Sahu	PM-Capacity Building, OLM, State Nutrition Cell
3.	Bhubaneswar	Nayan Mishra	PM-Nutrition, OLM, State Nutrition Cell
4.	Bhubaneswar	Nilamadhav Dighal	Manager-MIS and MLE, OLM, State Nutrition Cell
5.	Bhubaneswar	Satrupa Satapathy	YP, OLM, State Nutrition Cell
6.	Bhubaneswar	Surjit Behera	PRADAN
7.	Bhubaneswar	Ajit Naik	PRADAN
8.	Bhubaneswar	Gautam Pradhan	Harsha Trust
9.	Bhubaneswar	Jeetendra Pattnaik	M&E Coordinator, Harsha Trust
10.	Bhubaneswar	Soumyajeet Swain	Harsha Trust
11.	Bhubaneswar	Debjeet Sarangi	Living Farms
12.	Bhubaneswar	Srikant Mohanta	APF
13.	Bhubaneswar	Rajib Kumar Roul	APF
14.	Kalahandi	Durga Prasad Maharana	PD, DRDA
15.	Kalahandi	Shailesh Ranjan Pattnaik	DDH
16.	Kalahandi	Prashant Mishra	DPM, Kalahandi
17.	Kalahandi	Rumana Jafri	BDO, M. Rampur
18.	Kalahandi	Deepti Nayak	BPM, M Rampur
19.	Kalahandi	Parbati Pattnaik	MC, MGRENGA Coordinator
20.	Kalahandi	Kirtan Naik	Master Trainer
21.	Kalahandi	Nirakari Das	Master Trainer
22.	Kalahandi	Suresh Sangram	Master Trainer
23.	Kalahandi	Satyabrata Parida	BLRP, Living Farms
24.	Kalahandi	Jitendra Kumar Mishra	BDO, Lanjigarh
25.	Kalahandi	Ananta Narayan Panda	AHO, Lanjigarh
26.	Kalahandi	Alok Kumar Swain	BLRP, PRADAN
27.	Kalahandi	Sanat Kumar Sahu	BLC, Lanjigarh
28.	Kalahandi	Satya Narayan Misra	OLM (Bank linkages)
29.	Kalahandi	Hrudananda Mohapatra	PRADAN
30.	Rayagada	Bhimsen Sabar	PD DRDA
31.	Rayagada	Hemanata Bag	DPM, OLM
32.	Rayagada	Waheeda Begum	DSWO, Rayagada
33.	Rayagada	Jagganath Bindhani	ADH, Rayagada
34.	Rayagada	Niranjan Mahanandia	DLT, Rayagada
35.	Rayagada	Santosh Kumar Naik	DLT, Rayagada
36.	Rayagada	Murali Deopili	MC, MGNREGA
37.	Rayagada	Manoranjan Behera	YP
38.	Rayagada	Dilip Kumar Behera	BDO, Munigada
39.	Rayagada	Khirod Kumar Bhuiyan	BPM, Muniguda
40.	Rayagada	Manohar Gajibali	BLC, Muniguda
41.	Rayagada	Binayak	APO, Muniguda

SL. No.	Place/District	Name of the Participant	Designation/Organization
42.	Rayagada	Gatikrishna Behera	BLRP, Living Farms, Muniguda
43.	Rayagada	George Dungdung	BDO, Chandrapur
44.	Rayagada	Shravan Kumar	BLC, Chandrapur
45.	Rayagada	Sukru Das	BLRP, Living Farms, Chandrapur
46.	Sundargarh	Bhairab Singh	PD, DRDA, Sundergarh
47.	Sundargarh	Pratibha Das Singh	DSWO, Sundergarh
48.	Sundargarh	Samuel Toppo	DPM, OLM
49.	Sundargarh	Arbind Naik	BPM, Balisankara
50.	Sundargarh	Sujata Majhi	BLC, Balisankara
51.	Sundargarh	Roshni Lakra	BLC, Tangarpali
52.	Sundargarh	Helen Kiran Kujur	BLRP, Harsha Trust
53.	Sundargarh	Tapan Raut	BLRP, Harsha Trust
54.	Sundargarh	Basanti Lakra	BDO, Balisankara
55.	Sundargarh	Pratima Tanti	CDPO, Balisankara
56.	Sundargarh	Ranjit Nayak	APO, Balisankara
57.	Sundargarh	Sushanta Singh	BVO, Balisankara
58.	Sundargarh	Gitikrishna Patel	AHO, Balisankara
59.	Sundargarh	Soumendra Kumar Das	BDO, Tangarpali
60.	Sundargarh	Anjana Bhoi	CDPO, Tangarpali
61.	Sundargarh	Ranjana Choudhary	Master Trainer
62.	Sundargarh	Jayanti Nialipali	Master Trainer
63.	Sundargarh	Subhash Patel	MNREGA Assistant
64.	Sundargarh	Jagadeswara Behera	DDH, Sundega
65.	Sundargarh	Priyadarshini Rout	APO, Tangarpali
66.	Keonjhar	Uddhav Chandra Majhi	PD DRDA
67.	Keonjhar	Sapan Goswami	DPM
68.	Keonjhar	Dilip Kumar Bara	BDO, Telkoi
69.	Keonjhar	Iswar Chandra	BDO, Patna
70.	Keonjhar	Anjana Naik	APO, Telkoi
71.	Keonjhar	Madhusudan Pradhan	APO, Patna
72.	Keonjhar	Suprabha Mishra	CDPO, Telkoi
73.	Keonjhar	Vijayalaxmi Marandi	CDPO, Patna
74.	Keonjhar	Harekrishan Chand Hansda	AHO, Patna
75.	Keonjhar	Himanshu Shekhar Naik	BLC, Telkoi
76.	Keonjhar	Manoranjan Mahapatra	BPM, Patna
77.	Keonjhar	Satyajit Samal	BLRP, PRADAN
78.	Keonjhar	Smruti Kara	BLRP, PRADAN
79.	Keonjhar	Chandramani Shabar	BLRP, PRADAN
80.	Keonjhar	Shivanath Padhan	Master Trainer
81.	Keonjhar	Nirupama Mohanta	Master Trainer
82.	Keonjhar	Krishna Chandra Barik	Master Trainer
83.	Keonjhar	Hemalata Mahanta	Master Trainer
84.	Keonjhar	Jahan Zaib	YP
85.	Keonjhar	Ankit Soni	YP
86.	Jagatsinghpur	Saroj Kanta Mohanty	PD DRDA, Jagatsinghpur
87.	Jagatsinghpur	Premasi Nayak	DPM, Jagatsinghpur
88.	Jagatsinghpur	Mihir Samantaray	DDH, Jagatsinghpur
89.	Jagatsinghpur	Atal Bihari Swain	BDO, Tirtol

SL. No.	Place/District	Name of the Participant	Designation/Organization
90.	Jagatsinghpur	Lipika Sarangi	BPM, Tirtol
91.	Jagatsinghpur	Dr. Kalyan Sourabh Das	BDO, Balikuda
92.	Jagatsinghpur	Pratap Rudra Nanda	BPM, Balikuda
93.	Jagatsinghpur	Smruti Sarita Swain	BLC, Balikuda
94.	Jagatsinghpur	Anusuya Mohanty	BLC, Balikuda
95.	Jagatsinghpur	Subhashish Behera	BLRP, Living Farms, Jagatsinghpur
96.	Khurda	Alok Dash	Resource person, Living Farms
97.	Khurda	Haresh Prushti	Resource person, Living Farms
98.	Khurda	Bichitra Biswal	Resource person, Living Farms
99.	Khurda	Ramakanta Jena	Resource person, Living Farms
100.	Khurda	Gitanjali Sahu	Master Trainer, Pipli
101.	Khurda	Reena Dwivedi	Master Trainer, Deogarh
102.	Khurda	S Nagaraj Reddy	Master Trainer, Ganjam
103.	Khurda	Nirupama Mohanta	Master Trainer, Ganjam
104.	Ganjam	Rajesh Achary	BLRP, Chikitti, Harsha Trust
105.	Ganjam	Mami Badatiya	Woman Farmer, Rampa
106.	Ganjam	Kalpna Swain	BLRP, K. Singhpur, Living Farms
107.	Jagatsinghpur	Kadambini Behera	Farmer and GPLF Secretary, Redhua
108.	Malkangiri	Dibyasingh Pradhan	BLRP, Khairiput, Harsha Trust
109.	Ganjam	Bikas Ojha	BLRP, Beguniapada, Harsha Trust

List of Focus Group Discussions (FGDs) Conducted

SL. No.	District	Participants	Location
1.	Kalahandi	Members of SHGs/ CLF/ GPLF	Fatamunda village
2.	Kalahandi	Community cadres	Fatamunda village
3.	Kalahandi	Members of SHGs/ CLF/ GPLF	Mahulpada village
4.	Kalahandi	Community cadres	Mahulpada village
5.	Kalahandi	Members of SHGs/ CLF/ GPLF	Sanjamkiheju village
6.	Kalahandi	Community cadres	Sanjamkiheju village
7.	Rayagada	Community cadres	Dhobagudi village
8.	Rayagada	Members of SHGs/ CLF/ GPLF	Dhobagudi village
9.	Rayagada	Community cadres	Pandarakhil village
10.	Rayagada	Members of SHGs/ CLF/ GPLF	Pandarakhil village
11.	Keonjhar	Members of SHGs/ CLF/ GPLF	Mahishamandi village
12.	Keonjhar	Members of SHGs/ CLF/ GPLF	Kendeiposhi village
13.	Keonjhar	Community cadres	Mahishamandi village
14.	Keonjhar	Community cadres	Kendeiposhi village
15.	Keonjhar	Members of SHGs/ CLF/ GPLF	Tungurbahal village
16.	Keonjhar	Community cadres	Tungurbahal village
17.	Jagatsinghpur	Members of SHGs/ CLF/ GPLF	Alana village
18.	Jagatsinghpur	Members of SHGs/ CLF/ GPLF	Khankarapur village
19.	Jagatsinghpur	Community cadres	Alana village
20.	Jagatsinghpur	Community cadres	Khankarapur village