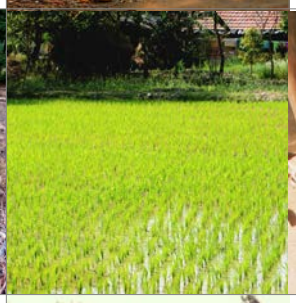
TRANSFORMING LIVELIHOODS DELIVERING IMPACT

An Investment Case for Integrated Farming Systems for SMALL and MARGINAL FARMERS





July2015




Is it possible to impact simultaneously the livelihoods of small & marginal farmers as well as enable them to transition from chemical intensive mono-cropping to ecologically sustainable farming practices?

HOW ? MODEL

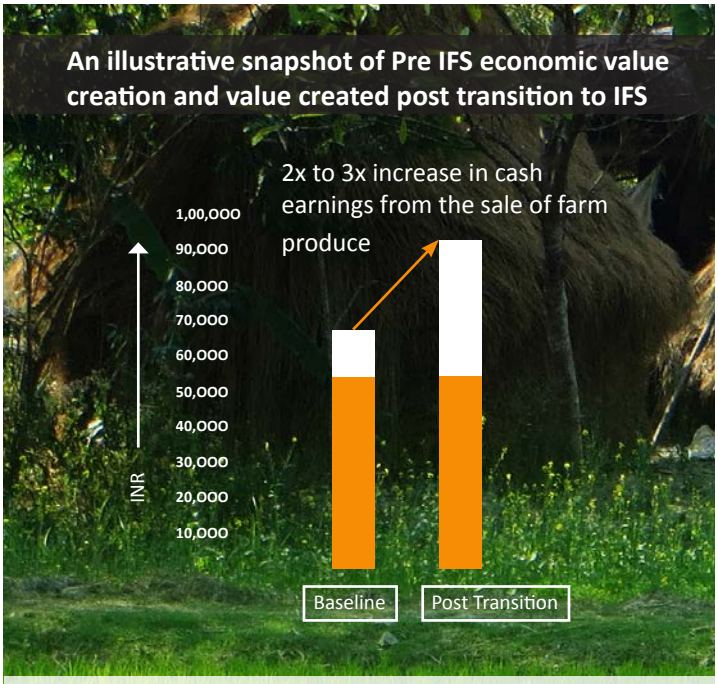
Yes,
through Bio Integrated Farming System (IFS) models

WHAT ? IMPACTS

Transitioning from chemical intensive mono-cropping to bio integrated farming models with limited dependence on external inputs.
Increase in farm production from diversified sub-systems resulting in significant cash earnings to the farmers.

WHO ? ENABLER

The model implemented by DRCSC, an enabler, is already showing signs of sustainability and scalability in the various agro-climatic zones of West Bengal.



Key Investment Features for a farmer

Total Investment	INR 40,000
Farmer's contribution	INR 10,000
Loan Amount	INR 30,000
Loan Period	5 years
IRR	85 -150%
Target Landholding Size	At least 1 acre

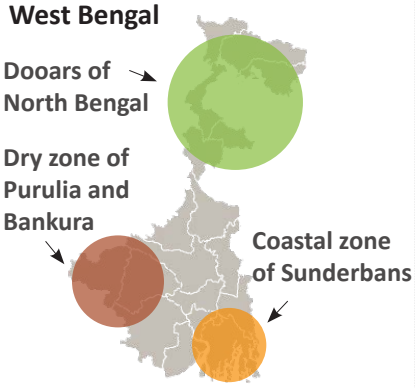
SCALING UP PARTNERSHIP OPPORTUNITIES: Do you want to be a part of it?

Scaling the IFS model to impact the livelihood of

1000

Small and Marginal Farmers

In three agro-climatic zones of West Bengal



Scaling up Investment for 1000 farmers: Total Investment INR 6 crores

- Grant Component for enabling organization INR 2 crores
- Loan Component INR 3 crores
- Farmer's Contribution INR 1 crore

About this Report

What farming model would you recommend to transform the livelihoods of the small and marginal farmers of India who constitute 85% of the total landholdings of India? Can the farmers invest in these models and generate economic returns adequate enough to payback the investments? These are big questions. This report aims to capture the early evidences from the fields of West Bengal on a promising model which answers the questions raised. This model known as Integrated Farming System (IFS) for small and marginal farmers has been piloted in two climatic zones of West Bengal: Wet Saline and Dry Laterite. Based on in-depth interviews with a small cross section of successful farmers practising this model of farming, reviewing the farmers' diary which captured their season wise production, earnings and expenses we have come to the conclusion there is an evidence of investment case for the farmers in these models. We humbly acknowledge a large scale cross-sectional study would have resulted in extensively validated conclusions. We also acknowledge that one model in its entirety may not be applicable all across India with several climatic zones and distinct farming practices. However the basic design principles of Integrated Farming Systems that are into play can be adopted across India and the model can be scaled up. In most cases, the missing actor is the Enabler of this model who facilitates the transition of the small and marginal farmers from their current farming practices to Integrated Farming Systems. In this study, DRCSC (Development Research Communication and Services Centre) played this crucial role of Enabler for about 100 farmers in Bankura and Purulia District of West Bengal and another 200 farmers in Patharpratima block of South 24 Parganas district of West Bengal.

We hope this study will raise curiosity and interest in this model of transforming livelihoods for the small and marginal farmers and inspire organisations to support and invest in this model.

About DRCSC

Development Research Communication and Services Centre (DRCSC), a non-profit development organization, formed in 1982 has been working as a resource centre for collection, collation and dissemination of information on various socio-economic issues and to highlight the struggles of various NGOs, CBOs and individuals to ensure social justice; especially for informal sector workers, indigenous communities and small & marginal farmers/landless labourers as well as self employed artisans. Along with that, since 1992, the centre focused on Sustainable Agriculture & Natural Resource Management for improving food & livelihood security of the rural poor. The centre stands for ensuring food and livelihood security of the rural poor through sustainable management of natural resources on the basis of principles and action.

About Change Alliance

Change Alliance, a wholly owned subsidiary of Christian Aid, UK has been working a various portfolio of projects with an ambition of bridging the social and economic gap in the Indian Masses and make growth inclusive and sustainable. Change Alliance provides market-leading development services and training, high quality technical and advisory consultancy, and capacity building to the development and private sectors and to government. Change Alliance is committed to working in partnership as a catalyst for change and understands the need to bring strategic stakeholders together to tackle complex challenges in a fast-moving development landscape.

About Re-emerging World

Re-emerging World (ReW) is a strategic advisory firm working with leading Multinational Corporations (MNCs), Businesses, Social Entrepreneurs and Institutions on their inclusive growth agenda in emerging markets. ReW focuses on innovation, insights and models at the intersection of business value creation, social and environmental impact. ReW was given the responsibility for conducting this study and report preparation.

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Executive Summary

It is estimated that for the poorest people, GDP growth originating in the agriculture sector is about four times more effective in reducing poverty than GDP growth originating outside the sector-making the sector critical for overall growth, poverty reduction, and food security in any nation. India, which predominantly remains an agrarian economy, has 58 % of its population dependent on the agriculture sector for their livelihoods.

Over the past five decades, the Indian Agriculture scenario has been witnessing a growing fragmentation of operational land holdings, with average land holding size declining from 2.3 ha from 1970-71 to 1.2 ha in 2010-11. The small and marginal farmer community who account for 85% of the total landholdings in India are seen as the most important players in the issue of future sustainable agricultural growth. In the current context, the majority of the small and marginal farmers have been experiencing the worse off implications of mono-cropping farming practices and use of chemical farm inputs, ever popularized since the green revolution period. Entangled in declining farm productivity, high input cost of fertilizers, degrading soil quality, unfavourable changes in ecological environment, the livelihoods of small and marginal farmers are on stake.

In this context, no single farm enterprise is likely to support the small and marginal farmers with adequate cash income and employment for the year around. Instead a judicious and effective integration of various sub farm systems suited to the given agro-climatic conditions holds the key to unlock the potential value from the small and marginal farming systems. An Integrated Farming Model (IFS), which is an integration of more than one type of agriculture and allied sub-systems designed for optimal utilization and management of available resources, can strategically transform the livelihoods of the small and marginal farming Indian community.

The report captures the economic viability and the potential of Integrated Farming System as an investment case for small and marginal farmers based on the early evidences from in-depth study of six small and marginal farmers in two distinct agro-climatic zones of eastern state of West Bengal: Wet Saline Zone and Dry laterite zone. Based on the in-depth analysis of the primary data collected, these small and marginal farmers who transitioned to bio integrated farming models in the two zones are successfully generating adequate cash income through out the year which was not the case earlier. The detailed case studies of the two successful farmers respectively from the two agro-climatic zones highlight the economic potential of introducing various sub-systems under an IFS approach for small and marginal farmers. An investment case of INR 40,000 for farmers having at least 1 acre of land is recommend. The report highlights the key features of the IFS model and its multifaceted benefits and address the underlying risks associated with the model and the mitigation steps. The potential breakthrough model can be scaled up for 1000 small and marginal farmers in four agro-climatic zones of West Bengal with an investment requirement of INR 6 crores/ USD 1 million.

The other key aspect of scaling up the IFS model is role of the enabler. Development Research Communication Service Centre (DRCSC), a non-profit development organization operating in varied agro-climatic zones in West Bengal has been diligently playing the role of this ‘enabler’ through introducing the model among the small and marginal community in West Bengal. An enabling organization, like DRCSC, which has been closely working with the small and marginal farming communities has a defining role to play for scaling up the model.

Integrated Farming System (IFS): a holistic model to promote productivity and sustainable well-being for small and marginal farmers

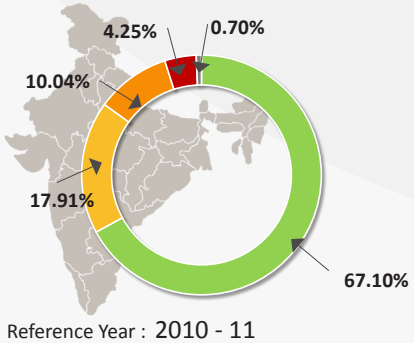
India has a predominantly agrarian economy and agriculture demographically remains the broadest economic sector of the nation. The current state and the future growth of the sector is underpinned on the performance of the small and marginal farmers of the nation.

The growing small landholding character of Indian Agriculture

Indian agriculture is characterised by the over-whelming presence of marginal and small farmers. As per the agricultural census 2011, there are about 138 million landholdings in India out of which small and marginal farmers account for 117 million land holdings. Small land holdings is also a distinct feature of West Bengal's agrarian economy, which engages maximum portion of the state's labour force. As per state agricultural census data in 2005-06, 95.5% of total land holdings belong to this category of farmers. Another significant trend evident from the previous five decades of agricultural census data is the successive decline in the average land holding size, highlighting the growing small landholding character of Indian Agriculture. Thus, Indian agriculture as it stands today and its future sustainability and growth will primarily depend on the productivity and performance of small and marginal farmers.

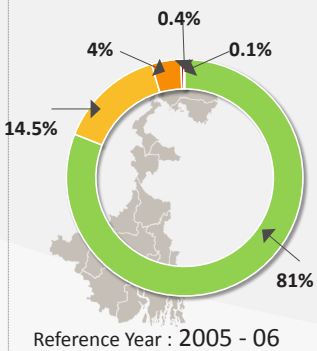
The Small and Marginal farmers feature as the most dominant class in the Indian Agriculture

Pan–India 85% of total landholdings belong to Small and Marginal Farmers



Reference Year : 2010 - 11

West Bengal 95.5% of total landholdings belong to Small and Marginal Farmers

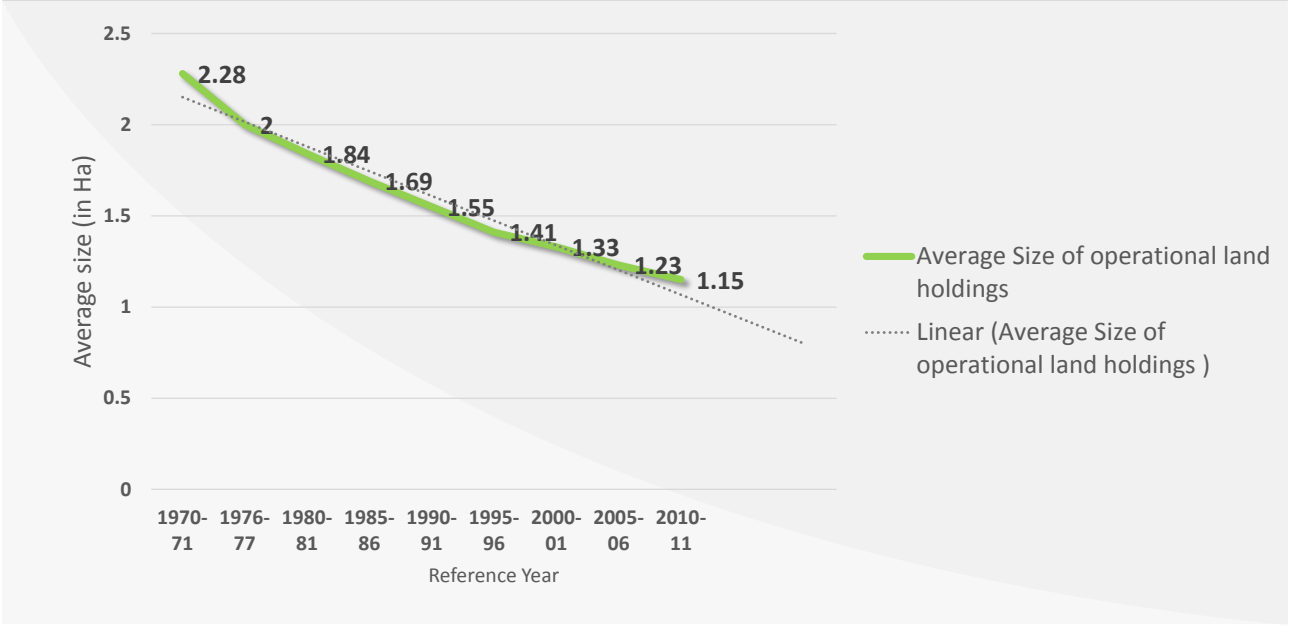


Reference Year : 2005 - 06

Type of Farmers	Land Size(in Ha)
Marginal Farmers	0-1
Small Farmers	1-2
Semi-Medium	2-4
Medium	4-10
Large	>10

Source: Agricultural Census in India 2011 , published by Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India

The growing 'small land holding' character of Indian Agriculture



Source: All India Report on Number and Area of Operational Land Holdings, published by Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India

Now, how well the small land holders are placed?

Since 1995, more than 290,000 farmers have committed suicide and around 2,358 farmers are quitting agriculture daily[1]. These figures necessarily does not reflect a positive light on the future outlook of small and marginal farming community. The implications of chemical intensive green revolution farming techniques coupled with high yielding dwarf varieties of one type of crops has polluted the foundations of Indian Agriculture. Entangled in declining farm productivity, high input cost of fertilizers, degrading soil quality, small land holders are finding it difficult to generate enough farm produce to even meet their family nutritional needs leave aside any incremental farm cash income.

Integrated Farming as a potential alternative development model

While there are no dearth of policy frameworks, regulations, recommendations to improve the predicament of small and marginal farmers, a core solution should be able to unlock the potential productivity of their farming systems. This key to unlock the efficiency and increased production is offered by the bio integrated farming models.

[1] http://focusweb.org/content/where-have-all-small-farmers-gone-story-agriculture-and-indian-farmers

About Integrated Farming System Models

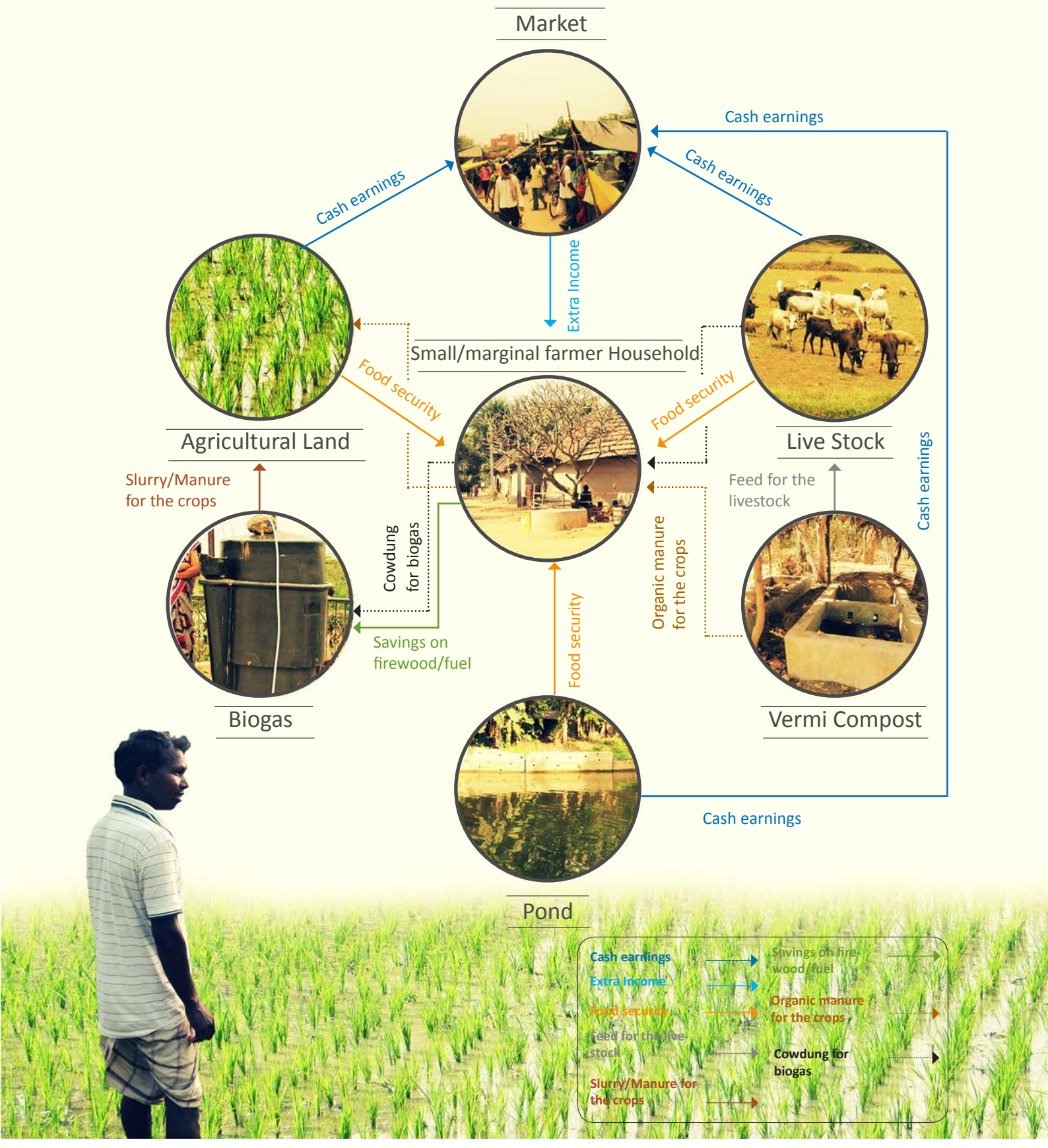
The concept of an integrated or an ecological farming system(IFS) is not new but a synthesis of traditional farming practices and modern scientific techniques which aims to optimize a farmer's produce with a given amount of resources through their effective utilization and interactive linkages among them. An IFS model sets to develop the production and management system of the farmer, where his farm along with all its sub-systems is viewed in a holistic manner. The integration and active inter-linkages of various sub-systems of the farm ensures optimization of resources, minimal dependence on external inputs and enhancement of the overall productivity and output.

The 'farming model' and its subsystems

The integrated farming model features a combination of enterprises or sub-systems in which the products or the by-products of one enterprise serves as the input for the production in other sub-systems. It is all about the natural coexistence, interaction and integration of different biotic species to achieve maximum productivity with minimal external flow of inputs.

Most of the small and marginal farmers in our country possess less than acre of land inclusive of paddy field, homestead garden, pond and livestock. The 'integrated farming model' leverages these already present subsystems by integrating them and also by introducing new subsystems including a vermi-compost pit and biogas which essentially serves the input requirements of the farming system and the household respectively.

The interactive linkages between various subsystems unlocks the true potential value of the entire farming system



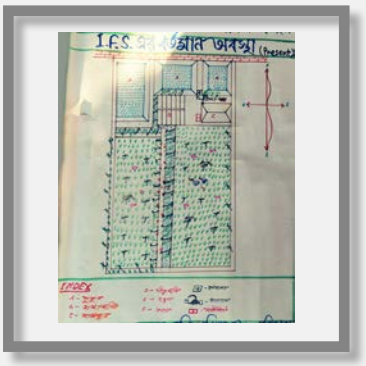
Integrated Farming Systems unlocks economic value of the small and marginal farmers through efficient land utilization and sub-system linkages

Pre-Integrated Farming Systems

Key Issues

- Dependence on chemical inputs
- Mono-cropping
- Marginal vegetable production for self consumption

Post Integrated Farming Systems



Economic Value unlocked through IFS

- Reduction in input costs through organic farming
- Self sufficiency in organic fertilizers, pesticides and seeds
- Focus on diversification of marketable produce: seasonal and perennial vegetables, fruits and fish

Emulating a productive natural ecosystem through subsystems:

- IFS enables diversification of the farm system at all levels including multi cropping and presence of multiple sub-systems to optimize the farm productivity
- The dependency on external input is gradually reduced to the minimal extent
- The key aspect is about the design of the farming subsystems and the way they will interact with each other

A successfully managed IFS model renders multi-faceted benefits

Within a period of 2-3 years, a well implemented IFS strategically transforms and optimizes the entire production system of the small and marginal farmers. The diverse sub-subsystems operating in efficient and holistic manners renders both monetary and non-monetary benefits to the farming household.

Adds Ons	How it benefits?
Increased food security 	The integrated farming approach ensures a flow of food from multiple sources including paddy land, nutritional garden, livestock, pond. Hence, rendering increased food security to the farmer's family.
Enhanced intake of nutritious and organic food 	A key advantage delivered by the IFS model is all year intake of nutritious and organic food completely devoid of chemical inputs.
Higher Cash Earnings 	The most tangible remuneration is in the form of higher cash earnings from the marketable surplus coming out of each of the sub-systems.
Restoration and preservation of soil fertility 	IFS uses organic fertilisers and bio pesticides for all farming thus resulting in restoration of soil fertility and conservation.
Cessation of seasonal migration 	IFS produce, sufficient cash income for the households through marketable surplus. This in turn reduces the compulsion of the farmer to migrate to the nearby town in search of daily labour work during lean season.
Minimal cash input cost for running the subsystems 	The by-product of each of the subsystems serves as an input for other sub-system hence gradually eliminating the external dependence on input.
Risk diversification 	The presence of multiple sub systems ensures that multiple sources of food security and cash earnings are present.

IFS is an investment case for small and marginal farmers

An Integrated Farming System model has a strong potential as an investment case for the small and marginal farmers. The model when successfully implemented and managed has very high likelihood of generating significant economic returns which not only allows the farmer to pay back the loan amount but also enhances his productive assets and long term financial wealth.

The following are the key the investment features of an Integrated Farming Model in current prices.

Investment Features	Dry Zone	Wet Zone
Typical land size 	1.5 acre -2.5 acre	1 acre – 2 acre
Typical Investment size 	INR 35,000 – INR 40,000	INR 40,000
Farmers Contribution (approximately 25% of the Investment Amount) 	INR 5,500	
Loan 	INR 34,500	
Investment Break-Up 	Subsystems available	
	Land redesign/Irrigation facilities	INR 10,000
	Vermi compost Pit	INR 7,000
	Biogas Plant(with Subsidy)	INR 16,000
	Livestock	INR 2,000
	Farm Input Cost	INR 3,500
	Other overheads	INR 5,000
Time Period for Implementation 	2-3 years	
Estimated Increase in Income 	3-4 times increase in cash earnings from Pre-IFS cash earnings	
Loan Repayment 	Can be considered starting from the 3rd year after the introduction and stabilisation of the sub-systems	
Internal Rate of Return[2] (without opportunity cost of labour) 	82%- 181%	
Internal Rate of Return (with opportunity cost of labour[3])	51%-80%	

Note: *The above conclusions are based on detailed in-depth interviews, review of diary and analysis of 6 farmers supported by DRCSC in two climatic zones .*

[2]Internal Rate of Return (IRR) is a rate of return used in capital budgeting to measure the profitability of investment. The higher a project's IRR, the more desirable it is to undertake the project. And an investment is considered to be acceptable if its IRR is greater than cost of capital

[3]Opportunity cost of labour is the real cost of next best choice of the labour foregone

Case studies

Success stories from the field- Case studies of marginal farmers successfully transitioned to IFS in two different agro climatic zones

DRCSC has been pioneering the task of introducing and popularizing the IFS model among the small and marginal in two distinct agro-climatic zones of West Bengal. The success stories of two marginal famers from two distinct agro-climatic zones testifies the potential of IFS in embarking transformations in the lives of the small and marginal famers.

Diversification and integration brings about the transition towards optimization and efficiency for Sukumol Mondal

Farmer's Profile

Sukumol Mondal, aged 51, is one of the 'successful marginal farmer' who has been able to make complete transition to organic and integrated farming approach among the 200 farmers trained on IFS technique in Patharpratima Block, South 24 Praganas district, West Bengal. He has a family of four including her wife and two sons, the younger son who is physically challenged.

At a Glance			
Total Land Size	Transited to IFS	Pre IFS cash earnings (Year 2004)	Post IFS cash earnings (Year 2014)
1.40 acre	Year 2005	INR 6,055	INR 38,815

IFS approach has enabled Sukumol to successfully generate marketable surplus without compromising his family's nutritional requirements

Back in 2004, Sukumol like most of the farmers in his block practiced mono cropping of paddy with intensive use of chemical fertilizers and pesticides. The total farm production was on declining spree and Sukumol was finding it difficult to even meet the basic nutritional needs of his family.

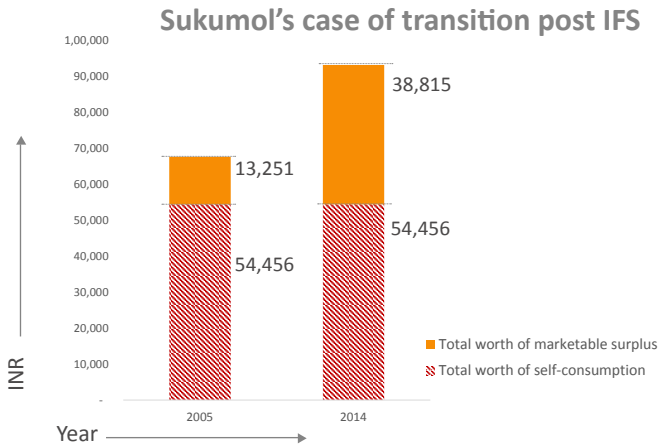
Determined to leap out from the vicious cycle of low and declining productivity, Sukumol got trained in IFS technique from the DRCSC regional centre in Pratharprartima in 2005. DRCSC supported him in reshaping of his pond and introducing other sub-systems including a vermicompost pit, biogas plant and livestock.

In 2014, Sukumol was able to generate enough farm produce which allows him to earn around INR 50,000 even after adequately fulfilling his family's nutritional requirements showcasing the evident economic returns from IFS.

A snapshot Pre IFS economic value creation and value created in 2014 : IFS has created sizable marketable surplus for Sukumol Mondal

Note:

1. *Cash earnings and worth of self-consumption is considered only for farmland; labour cost is not factored in*
2. *The worth of self-consumption is considered equivalent for year 2005 & 2014 as both farmers were able to produce for self consumption in 2005*
3. *The cash earnings in year 2005 have been adjusted to 2014 prices, Net Cash earnings of Sukumol mondol in year 2005 was INR 5,664*
4. *The earnings do not include other income sources like daily labour*

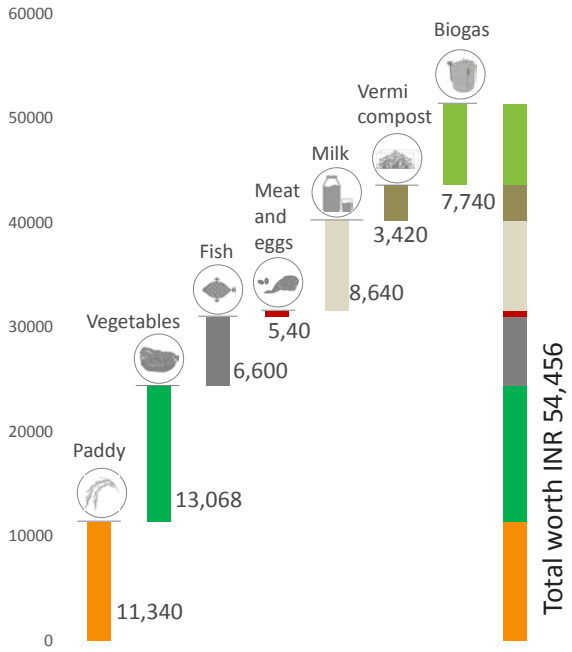


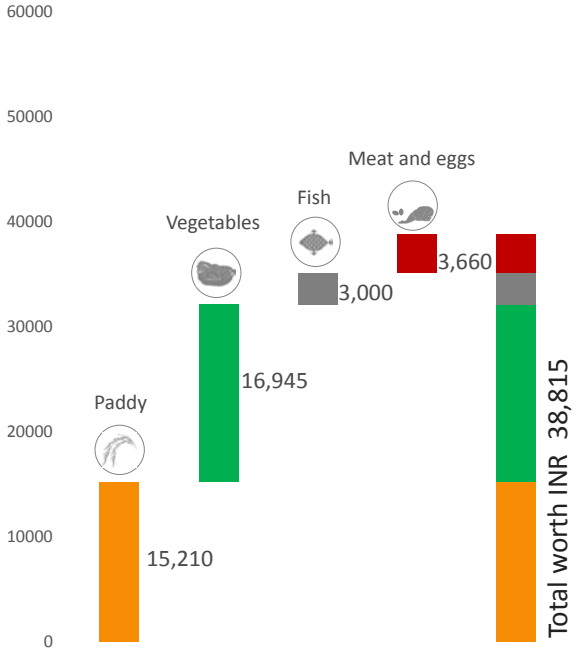
The interactive sub-systems and organic farming approach plays a key role in ensuring long-term economic viability and scalability of the model

The profitability of IFS and its impact on Sukumol's farm cash income is best explained by the presence and interactive linkages between the various sub-systems present.

Sukumol has been effectively using each of the sub-systems product or by product as input for the other sub-subsystem. The eventual impact is the minimal dependency on external input including chemical fertilizers, pesticides and feed which significantly reduces the overall input cost and also ensures the longevity of the farming system.

IFS created economic value both for internal consumption as well as by selling surplus in markets as in the case of Sukomol Mondal in 2014





Note:

1. *Considering 3 crop seasons in 2014 : Rabi, Pre-Kharif and Kharif*

Sub-systems	Role in the Farming System	
	Input Based	Output Based
Pond  **(0.248 acre)**	Serves as the perennial source of water for irrigation of crops throughout all the seasons The trench acts as a natural drain for flooding the saline water	Source of fish which is used both for self-consumption and also as a marketable surplus
Livestock  **(3 cows, 25 chicken)**	Cowdung is used in the production of the biogas, a source of alternative cooking energy. The excreta from chickens is used as a fish feed and also as an organic manure in his field.	Milk, eggs and meat serves both the nutritional requirements of Sukumol's family as well generates cash earnings
Biogas  **(0.002 acre)**	Slurry from biogas is used as an organic manure	Savings on year's cooking expenses on a subsidized LPG cylinder
Vermi compost Pit  **(0.002 acre)**	Serves the organic manure for crop cultivation as well as for feed stock	Sale of organic manure in the market

The investment has delivered Internal Rate of Return of 62% over a period of 15 years

In year 2005-06, Sukumol incurred an investment INR 20,419 for transiting to IFS approach. The investment was financed by his own cash (INR 4,200) and support from DRCSC (INR 16,219). The significant increase of cash earnings from the marketable surplus by 220% since the last 10 year testifies the investment case of Sukomal and marginal farmers like him.

Enhancing efficiency and Unlocking Value

Farmer's Profile

Khepu Hembram, aged 56, is a marginal farmer in the Chhatna block of Bankura, one of the driest district of West Bengal with hard beds of red laterite soil. Undeterred by the natural challenges of red soil and unfavourable weather, Khepu is one of the farmers in Bankura who has perfected the crop mixing science and integrating and managing various sub-systems which in turn has rendered a transformative change in his livelihood earnings.

At a Glance

Total Land Size	Transited to IFS	Pre IFS cash earnings (Year 2011)	Post IFS cash earnings (Year 2014)
1.40 acre	Year 2012	INR 9,135	INR 64,255

Redesigning to an ecologically oriented farm along with IFS approach has resulted in sustainable and optimized economic value creation

Before making the transition to IFS in 2012, Khepu Hembram like his ancestors was typically involved in mono cropping practices and usage of chemically intensive inputs for crop production. Back then, Khepu had to resort to seasonal migration in search of alternative livelihood opportunities as the produce of his farm was not adequate to serve the food requirements of his family of four.

In 2012, Khepu decided to adopt the bio integrated farming approach after receiving training from the local DRCSC centre. Post transition in 2013 and 2014, his average cash earnings has increased to INR 64,414 from less than INR 10,000 annually.

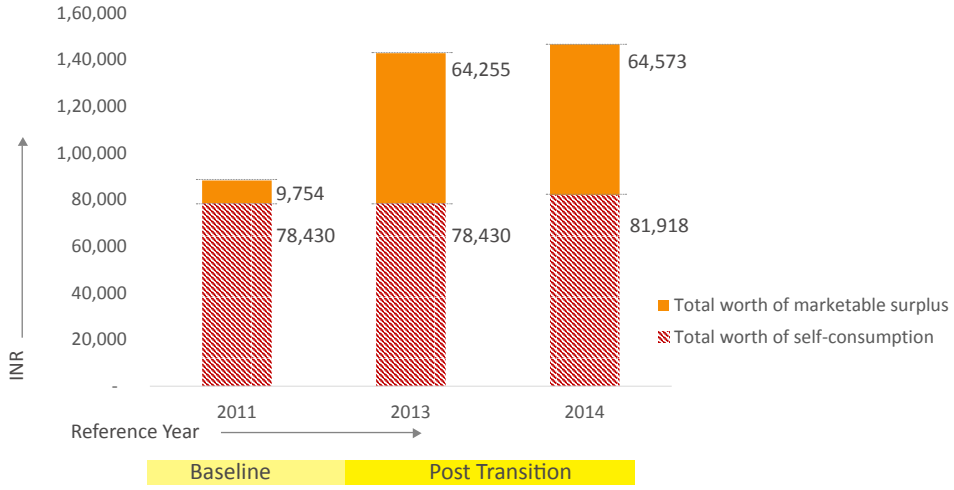
Transitioning to IFS has enabled Khepu to generate significant cash earnings from his farming system while adequately satisfying his family annual food requirements.

A snapshot Pre IFS economic value creation and value created in 2013 & 2014 : IFS have created sizable marketable surplus for Khepu Hembram

Khepu Hembram's case of cash value creation post transition to Dry IFS model

Note:

1. *Cash earnings and worth of self-consumption is considered only for farmland; labour cost is not factored in*
2. *The worth of self-consumption is considered equivalent for year 2011 & 2013 as in both periods farmers were able to produce for self consumption*
3. *The cash earnings in year 2011 have been adjusted to 2013 prices, Net Cash earnings of Khepu Hembram in year 2011 was INR 9,135*
4. *The earnings do not include other income sources like daily labour*



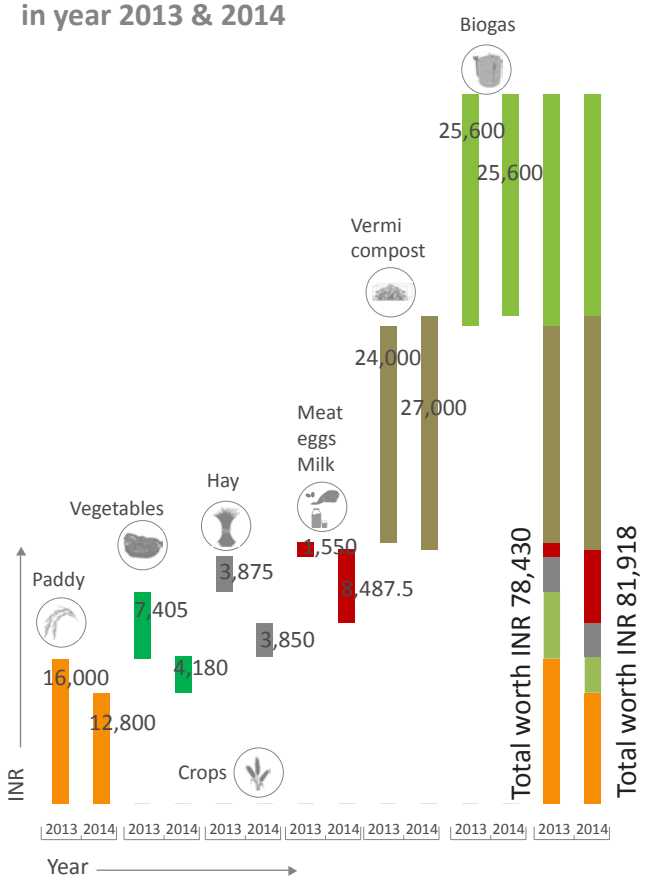
Increasing diversification and resource integration has opened up multiple sources of family consumption and also marketable surplus for Khepu Hembram

The innovation around integrating the crops with various other sub-systems including livestock, vermicompost, biogas has resulted in significant increase in economic value creation as well for self-consumption for Khepu's family.

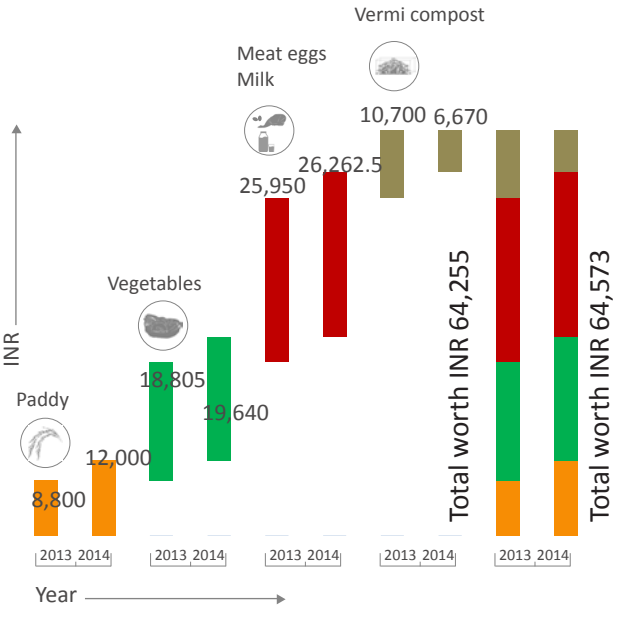
Khepu in order to keep all his production or sub-systems unit in business has been successfully been able to link all of them with one another. This in turn on one hand has significantly reduced his cash input cost incurred by the various sub systems and on other hand has resulted in higher cash earnings from the marketable surplus generated.

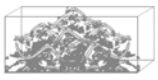
IFS created economic value both for internal consumption as well as by selling surplus in markets as in the case of Khepu Hembram in 2014

Total Worth of Self-Consumption in year 2013 & 2014



Total worth of Marketable Surplus in year 2013 & 2014



Sub-systems	Role in the Farming System	
	Input Based	Output Based
Livestock **(4 cows, 2 calf, 3 ducks, 18 Hens, 30 lambs,Goat 3)** 	Cow urine is used the field as alternative to pesticides. Cow dung is used to produce biogas which serves as cooking fuel for his household as well as slurry, used as an organic manure in the field.	Khepu is able to earn a significant amount of cash from the sale of milk, chicken meat, eggs and even at times through sale of live animals.
Biogas **(0.002 acre)** 	Slurry from biogas is used as an organic manure for crops	Through the biogas produced, Khepu is able to save on the purchase of firewood worth INR 4,000
Vermi compost Pit **(0.002 acre)** 	Vermi compost pit serves as the perennial and organic source of fertilizers which not only helps in producing organic produce but also helps to ensure the longevity of the soil. It also serves as healthy feed for his large livestock.	Sale of organic manure in the market

The investment can deliver an Internal Rate of Return of 192% over a period of 8 years

In year 2012, Khepu incurred an investment INR 22,730 for transiting to IFS approach. The investment was financed by his own cash (INR 4,780) and support from DRCSC (INR 17,950). The significant increase of cash earnings (about 6 times) from the marketable surplus in the last 2 years testifies the investment case of Khepu and marginal farmers like him.

The desired target small and marginal farmer's profile

The success quotient of an integrated farming model is a function of the profile of the farmer who adopts and executes the model in his farmland rigorously over a period of years. In this context, a certain set of attributes sets if present in the farmer will drive him to stand out as the real investor in the IFS model rather than a typical beneficiary from the IFS model.

A farmer selected for the IFS investment package based on the set of preferred attributes can significantly increase the likelihood of the greater returns from the investment made.

Target Profile of the Small and Marginal Farmers

Intangible Attributes

Motivated 2nd generation farmers who are willing to explore and transition to sustainable & scalable farming models

Tangible Attributes

- Land Size: minimum of 1 acre
- Livestock: At least 2 cows in the farming household
- Financial Credibility: No previous record of loan default

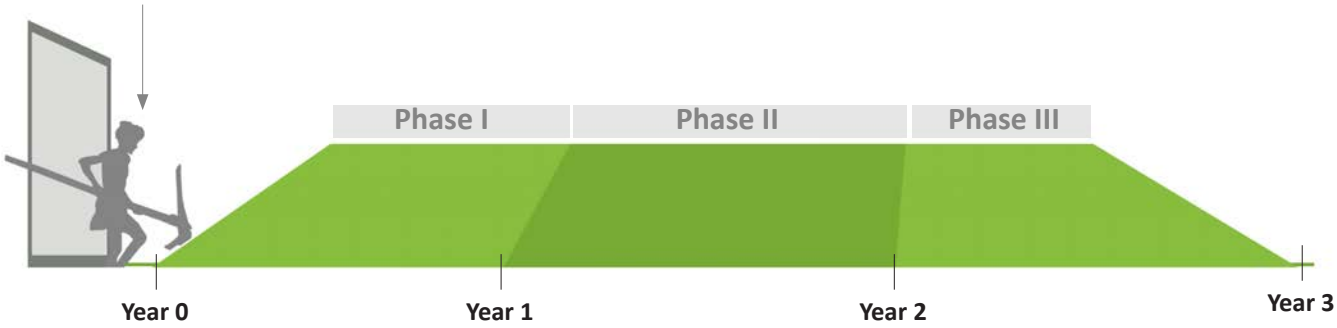
The real investment package of the IFS model for the target farmer profile

A farmer within the target profile who is willing to invest in the IFS model will not only be offered with the loan amount for the introduction of various sub-systems but also with entire technical training, consultancy, handholding and monitoring support for a period of 2-3 years by the enabling organization.

The modification of the existing systems and introduction of new sub-systems will happen in a phase wise manner from year 0 after assessment of the existing farming model.

The investment package of the IFS model for the farmer

Screening & Selection of the farmer



- Assessment of the current sub-systems
- Decision of which sub-systems need to be modified and added
- Decision of total investment required
- Consultancy and technical training services on IFS

- Disbursement of first loan tranche
- Introduction of new systems
- Monitoring and handholding support to the farmers

- Disbursement of second loan tranche
- Introduction of other sub-systems
- Monitoring and handholding support to the farmers

- Monitoring support

Phase wise introduction of the sub-systems

Period of Implementation: 2-3 years

Typical investment size: INR 40,000, 25% of total amount to be paid by farmer and rest by enabling organization

Critical Success factors for the IFS model

The overall success of the IFS model will depend on the success of the IFS model at multiple farmers' level. The table below present some of the enabling success factors of the model.

Success factors

Factors	Impact
Proper assessment of farmer's profile and the sub-systems before selection	A critical assessment of the farmer's profile both in terms of tangible and intangible attributes as well as the existing sub systems is imperative for the success of the model.
Continuous handholding and monitoring support	Given the nature of IFS, which requires high skills and dedicated efforts by the farmer a continuous handholding and monitoring support at the micro level is deemed important at the micro level.
A marketing arm in the 2nd year of the project to link the farmer's produce to the market and derive optimum value	A marketing outlet for linking the organic farm produce to the market will ensure that the farmers get the right value of their produce and able to generate adequate cash to pay back the loan.

Key underlying risks to be mitigated in an integrated farming model

The integrated farming model embedded with multi commodity farming system presents significant advantages to the small and marginal farmers than a mono cropping system. There are certain key underlying risks in the IFS model which needs to be mitigated to leverage the potential of the model and ensure its scalability in long run.

Risk	Nature	Mitigation Steps
Low cash returns in the initial years 	The initial years post transition to IFS fetches low marketable surplus. This is due to fact that the sub-systems requires some period of time to integrate among themselves and transition from external and chemical input based model to internal and organic based model. The low cash earnings post investment can impact the famer's commitment and motivation to continue with the bio-integrated farming approach.	• Introduction of crops with high market value in the initial crop mix for the farmer • Regular handholding and training support from the organization(DRCSC in this case) is indispensable to keep the famer's commitment high in continuing with the IFS approach

Risk	Nature	Mitigation Steps
Inefficient management of the entire farming model 	The critical success factor is the efficient management of the resource flow in the sub-systems of the farming model. Inefficiency in creating interlinkages among the sub-system can hamper the production as well increase the overall cost of the maintaining the farming system.	• Proper technical training about the science of creating the interlinkages and resource flow • Continuous monitoring support to the farmers to ensure they correctly get the fundamentals of integrated farming system
Unavailability of adequate family labour 	Among other farming approaches, IFS is a relatively labour-intensive model. Since, labour is core input to the model, lack of it can lead to inefficient management and disintegration of the model.	• The farmer's family profile should be taken into consideration while introducing the model • Presence of atleast 2 adult family members is necessary criteria for the amount of work required
Exogenous Shocks 	Natural disasters including floods, droughts, etc can impact the entire farming model which stands as the only overall livelihood base for the farmer	• Financial instruments including crop and livestock insurance can enable the farmers to reduce the impact of such exogenous shocks These insurance products can be explored into forms like: - Existing crop insurance products - CSR insurance products - Development agencies fund - New insurance products that can be brought in
Low land size and Location of the land 	Land size and location of farm land are two important factors which determines the potential and scalability of an IFS model. A smaller land size (<0.5 acre) and far location of land from other subsystems and market can have a negative impact.	• The target farmer's should have at least landholding size of 0.6 acre to 1.5 acre so that marketable surplus can be produced and sub systems can feed each other.

The Indispensable Role of the Enabler in the introduction and scalability of the IFS model

An important pre-requisite to help the small and marginal farmers make a complete transition from mono-cropping practices and use of chemical fertilizers to bio-integrated farming models is an 'Enabler'. Development Research Communication Service Centre (DRCSC), a non-profit development organization operating in varied agro-climatic zones in West Bengal has been diligently playing the role of this 'enabler'. DRCSC has been seeking to enhance the adaptive capacity of the vulnerable small and marginal farmer families through not only training and providing handholding support for the implementation of the IFS models but also providing grant support required for introducing various sub-systems.

An enabling organization, like DRCSC, which has been closely working with the small and marginal farming communities has a defining role to play for scaling up the model.

Scaling up the integrated farming model

Integrated farming approach could be major breakthrough especially in the context of small and marginal farmers who can efficiently leverage their resource base to unlock optimum value from their farming systems. The success stories of famers practising the integrated farming approach in two distinct agro- climatic zones provide emerging evidences for scaling up of the model. The model can be envisioned to be scaled in two distinct ways:

- Scale to reach 1000 farmers in 3 zones of West Bengal
- Formation of Social Enterprise to link farmers to market

Scale to reach 1000 farmers in 3 zones of West Bengal

In the next phase DRCSC can scale this model to about 1000 farmers in 3 zones of West Bengal

- Dry Zone of Purulia and Bankura
- Coastal Zone of Sunderbans
- Dooars in North Bengal

The target farmer's profile in terms of landholding size

The small and marginal farmers with at least 1 acre land will be the target profile for scaling up the model. This is a pre-requisite while introducing the model as farmers with such a land size can leverage the full potential of the various subsystems and hence can generate enough marketable surplus and consequently cash earnings from the surplus.

Investment Requirements

Investment requirement at each Farmer level

The investment break up of INR 60,000 for each farmer is as follows

- For IFS : INR 40,000
  - o 25% ie INR 10,000 will be farmers contribution
  - o 75% ie INR 30,000 will be loan financed which the farmer can pay over a 5 year period starting from 3rd year of transition to IFS
- Program Costs for Identification, Training and Handholding support for 3 years
  - o INR 20,000 as grant to the enabling organisation

Investment break-up for IFS per farmer and scale up to 1000 farmers

Investment breakup of IFS per farmer
INR 60,000

Investment breakup of IFS for 1000 farmers
INR 6 crores/ USD 1 million

Purpose	Amount	Type of Financing
Program Costs	INR 20,000	Partly Grant financed
IFS Sub-systems cost	INR 40,000	75 % Loan Financing (Repayment may start From Year 3)
		25% Initial Cash Investment of farmer

Grant Component
INR 2 crores

Loan Component
INR 3 crores

Farmers Contribution
INR 1 crore

Investment Requirement for 1000 farmers

The total investment requirement is of INR 6 crores/ USD 1 million and the breakup is as follows

- 16.7 % will be farmers contribution (INR 1 crore /USD 166,667)
- 50% will be a revolving loan component for 8 years (INR 3 crores/ USD 0.5 million)
- 33.3% will be grant component for program support activities. (INR 2 crores/USD 333,333)

The first steps to scale up the model can be started with a selection of 20 farmers from the dry zone and 30 farmers from the wet zone and can follow a phase wise expansion strategy.

Formation of Social Enterprise to link Farmers to Market

The practitioners of Integrated Farming Systems produce organic crops and vegetables. However when these farmers sell their produce in the nearest market they have to compete in price with farm produce using chemical fertilisers and pesticides. There is no price differential for organic farm produce in the local markets of the farmers.

This leads to another potential opportunity for an enabling organisation like DRCSC to incubate a social enterprise which can link the farmer produce to nearby urban markets. The social enterprise or the marketing arm can be managed by agri-prenuers who can work with a group of 25 IFS farmers; sourcing their farm produce to the market. This approach can ensure the right price for the farm produce and thereby transferring greater monetary benefits to the farmers.

A feasibility study can be carried out by DRCSC to assess an opportunity like this where they can connect the cluster of farmer they are supporting to the urban markets through a sustainable social enterprise approach. This social enterprise may not be only limited to fresh farm produce but can act as a marketing organisation for all types of farm and community like date palm and Palmyra palm jaggery and syrup.

Annexures

Introducing the context of the study

The study of the economic viability and the assessment of the investment case of the Integrated Farming System model was done through detailed interviews with 6 farmers practising the model in two distinct climatic zones of West Bengal:

- Saline zone: Patharprtaima block, South 24-Paraganas
- Dry zone: Purulia and Bankura

Locational profiles

The locational profiles has been deliberately chosen from distinct agro-climatic zones within a same geographical region to assess the success of the IFS model taking into consideration multiple external factors.

West Bengal Map

Study area	Physical features	Climatic features	Livelihood features
Purulia 	1.Westernmost district of West Bengal 2.Has hills, plateaus and plains 3.Soil reddish in colour with high iron content	1.Drought prone district 2.Sub-tropical climate with very high temperature in summer and low nippy temperature in winter 3.Uneven, scanty rainfall	Agriculture is the principal source of livelihood
Bankura 	1.Connecting link between plains of Bengal and Chota Nagpur Plateau 2.Low lying alluvial plains in the east and north east 3.Rocky hillocks towards the west	1.Dry and hot summers 2.Moderate monsoons 3.Winters are cool and starts from early October	1.Forests are the main sources of livelihood 2.Some cash income is there from fuel-wood and non-timber forest practices
South 24 Parganas 	1.Located in kakdwip subdivision of South 24 parganas 2.Freshwater swamp mangrove forests on the coastal fringe 3. Soils are silt-loam in texture	1.Tropical climate 2.Summers have much more rainfall compared with winter	1.Non-timber forest produce 2.Agriculture and fishing

Data Collection Methodology

- In-depth interviews (Duration 2hrs – 3hrs) with farmers (7 in total)
- Review of farmer diary where season wise production and sales of crops, vegetables and costs were recorded

Key Assumptions of the study:

- The project life time for the IFS model is considered to be 12 years with first 2 years dedicated in implementing the sub-systems and it forms the basis of calculation of the Internal Rate of Return
- The growth rate of cash earnings is assumed to 5%
- The IRR analysis for the farmers presented in the case study does not include the opportunity cost of labour
- The terminal value of the investment on the IFS model is considered to be zero

Internal Rate of Return on investment of IFS model for 6 farmers interviewed in the dry and wet zone:

Internal Rate of Return on investment of IFS Model

Dry Zone	With opportunity cost of labour	Without opportunity cost of labour
Subodh and Panmnati Haldar	97%	227%
Pashupati	53%	187%
Srimonta Soren	71%	117%
Khepu Hembram	97%	192%
Average	**80%**	**181%**
Wet Zone		
Gauri Mondal	72%	102%
Sukumol Mondal	30%	62%
Average	**51%**	**82%**

Limitations of this Study

- Limited Sample size
- We have analysed primarily from economic point of view and whether IFS makes a good investment case for small and marginal farmers. We have highlighted the detailed cases studies of those farmers who have been able to make the transition and benefitted at varied degrees of success from this transition.

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