CarbonVerse

A FIELD GUIDE · PART I

Unlocking the Wealth in Our Fields

Zero Budget Natural Farming for Productive Farms, Ecological Renewal and the Path to Carbon Credits

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Moong fields with neem boundaries. An illustrative Indian kharif setting.

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01

I · UNDERSTANDING THE SYSTEM

The wealth in a field

A farmer can bring home a good harvest and still have very little left after paying the bills. Seed, irrigation, hired labour and borrowing have to be paid for. The family has put in its own work too, often without counting the hours. By the time the crop is sold, the size of the harvest tells only part of the story.

For an agricultural economist, the next question is what remains with the farmer. There is the money left after expenses, certainly. There is also the condition of the field that must produce the next crop. A season's income and the ability to earn from the same land in the years ahead belong in the same conversation.

That is where I want to begin this book.

Our fields hold a great deal of work and knowledge. Decisions about sowing, water and the use of residues draw on what a farmer knows about the land, as well as what the household can afford. A proposed change in farming has to make sense within that life. It must help the person who will carry it out.

Zero budget natural farming deserves to be examined from this starting point. Its promise is appealing: make better use of local resources and the life of the soil, reduce dependence on purchased inputs, and help the farmer keep more of what the field earns. The question is how well that promise holds in different crops and places. This book also asks whether the climate benefits that can be demonstrated should bring farmers an additional return through carbon credits.

Three connected accounts of a field



Household economics

Cash, work and full costs



Ecological condition

Soil, water and selected organisms



Climate outcomes

Relevant net gases and stocks

An outcome in one account does not automatically establish an outcome in another.

What does the farmer keep?

Two farmers can sell similar harvests and end the season in very different positions. One may have spent more on materials. The other may have relied on more family labour or on resources already available at home. Sale receipts alone will not tell us who is better off.

Follow the work as closely as the money:

- Count the ingredients used in a farm-made preparation.
- Count the time spent collecting, preparing and applying it.
- Ask who does that work and what else they would be doing at that time.

The saving may still be worthwhile. Counting the work helps us understand how worthwhile it is, and for whom.

The same care is needed with the produce that never reaches a market. Grain kept for the household, fodder fed to cattle and a second crop grown between the rows can all contribute to the family's living. Their value belongs in the farm account. So does the value of a residue returned to the soil, provided we do not also count it as though it had been sold.

A change in practice can make these calculations harder during the first season. The farmer is learning. Materials may have to be arranged differently. There may be more work before any saving is visible. A household still has expenses to meet during that time. Anyone recommending a transition should be willing to explain how the family is expected to manage it.

What zero budget means in practice

Zero budget natural farming puts a practical question before us: how much of what a crop needs can be supplied through the farm's own resources, local materials and biological processes?

The phrase does not make labour or water free. A family that keeps cattle pays for their care in one form or another. Collecting biomass takes time. Equipment wears out. A preparation made on the farm still uses materials. Recognising these costs gives us a useful way to judge whether the approach is reducing the farmer's dependence on cash purchases and improving the return from the field.

Indian natural-farming guidance describes seed treatment, farm-prepared formulations, soil cover and the management of moisture and air around roots. Beejamrit, Jeevamrit, mulching and Waaphasa are familiar foundations of this approach. We will look closely at each of them in the chapters ahead. [SO1]

The farming system matters as much as any one preparation. A farmer needs to know how the practices fit the crop, the soil and the water available. The advice also has to account for a missing resource: what happens, for example, when there is too little suitable material for mulch, or when the work falls at the busiest time of the season? These are questions to resolve in the field and in the design of a support programme.

What the field can show us

There are good reasons to study this approach seriously. In 2023, Duddigan and colleagues reported encouraging yield and soil-moisture results from controlled natural-farming experiments. The results varied with crop and location. Over the period studied, they found no significant treatment effect on soil organic carbon. [SO4]

A 2025 study by Berger and colleagues examined Andhra Pradesh's programme and reported economic and biodiversity benefits without an overall yield penalty in the systems studied. It offers evidence of what can work at programme level, while leaving open how results will differ elsewhere. [S05]

The distinction between these findings is useful. A field can hold moisture better without a detectable increase in its carbon stock over the same period. A farmer can earn more because cultivation costs fall, even if yield stays much the same. Each is a result worth understanding.

We should be equally interested in the circumstances that produce less favourable results. A practice that works with one crop may need adjustment for another. An apparent saving may depend on labour that a different household cannot spare. The aim of research is to give farmers better grounds for a decision, including a clearer idea of where an approach is likely to suit them.

Where carbon credits enter the picture

The idea of earning from a field's climate contribution is an important part of this book. To pursue it, we need to be clear about what a carbon credit represents.

The question is how much a change in practice has reduced greenhouse-gas emissions or removed carbon dioxide, compared with what would otherwise have happened. That comparison needs a defensible starting point, records and measurements. It also needs an independent check under the rules of the programme issuing the credit.

Verra's improved agricultural land management methodology already provides a framework for relevant changes in farm management. Its requirements cover the baseline, additionality, quantification and uncertainty. The current version has published corrections and clarifications that also apply. These rules have to be met by the project seeking recognition. [S07, S08]

For natural farming, this gives us a research task as well as an opportunity. We need to establish which practices produce a climate benefit, how that benefit can be measured and where existing methods can accommodate it. Where a gap remains, we need to identify exactly what evidence or change in method would address it.

I want the case made here to be strong enough for that scrutiny. Farmers stand to gain little from a promise that cannot survive the checks required to turn it into a payment.

Keeping track of what comes from where

A field may have trees on its boundaries, a change in how paddy is irrigated and a change in its soil-carbon stock. Several benefits may occur together. Before claiming them, we have to establish what each comes from and whether any part has already been counted.

Adding biochar or rock weathering creates further questions. Either may contribute a useful result, but that result cannot simply be attributed to the original natural-farming practices. A livestock-methane project needs its own account as well. The proposed pilot must let us distinguish these effects and examine what happens when they are combined.

Some of the field's value will sit outside the carbon account. Water saved or a better habitat for useful organisms can matter greatly to a farmer. Those benefits deserve to be described in terms that make sense for them. We do not need to turn every improvement into a carbon unit to take it seriously.

This means keeping the farm's earnings, its ecological condition and its measured climate contribution visible throughout the study. Bringing them together will tell us more about the field. Keeping their measurements distinct will make the findings more trustworthy.

The farmer's place in the arrangement

A carbon price is only the beginning of a payment calculation. Sampling, laboratory work, record keeping and independent verification cost money. The farmer needs to know what those costs are, how they are paid and what amount will reach the household.

Before agreeing to participate, the farmer should have clear answers:

- What work will I need to do?
- Who may use my farm's data?
- Which costs will be deducted from my payment?
- When will the money reach me?

The project developer, farmer organisation and buyer should be able to explain these terms plainly.

Within the family, we also need to ask who does the extra work. If making preparations or collecting materials adds to the work of women or other family members, that belongs in the assessment. Where a tenant cultivates the field, the responsibilities and benefit arrangements must reflect that person's circumstances.

Even a familiar resource can have several users. Residue laid down as mulch might otherwise feed an animal or supply fuel. Sending it to a kiln changes what is available at home and on the field. Such choices should be recorded before we describe a combined project as beneficial.

What we propose to find out

The proposed pilot will begin with records of the farms as they are, then follow clearly described changes over time. It will compare management systems and keep additional interventions identifiable. Alongside production and income, it will examine ecological conditions and the climate outcomes the evidence can support.

Some results may be encouraging. Others may show little change, or reveal a problem that needs attention. If soil carbon does not measurably increase, we must say so. That would leave any demonstrated saving or water benefit intact, but change the soil-carbon claim. A measured carbon gain would still have to be considered alongside the farmer's work and earnings.

The proposal is to assess natural farming as a connected farming system and give its verified climate contribution a fair route to recognition. The work has to be good enough to serve both the farmer making a decision and the institution asked to recognise a credit.

The next chapter turns to the practices themselves: what they ask of the farmer, why they are used and what we need to understand about them.

02

I · UNDERSTANDING THE SYSTEM

What zero budget natural farming means

Before a crop is sown, a household makes a series of commitments. Some require money immediately. Others require work next week, fodder through the summer or water at the right stage of growth. A farming system changes these commitments. Understanding that change is more useful than beginning with a promise that cultivation can cost nothing.

Zero budget natural farming asks the farmer to draw more carefully on resources within the farm and its surroundings. It gives particular attention to seed treatment, farm-prepared formulations, soil cover and the balance of moisture and air around roots. These familiar foundations are called Beejamrit, Jeevamrit, mulching and Waaphasa. They belong within the management of the whole cropping year. [SO1]

The word budget directs our attention to dependence: how much money must leave the household before the crop can earn? The answer matters to a farmer who borrows for cultivation. It also matters to someone whose principal constraint is the availability of labour. Reducing one kind of dependence while increasing another should be a conscious choice.

Four foundations within the cropping year

1 **Beejamrit**

Seed and establishment

2 **Jeevamrit**

Preparations and biological processes

3 **Mulching**

The surface and its materials

4 **Waaphasa**

Moisture and air around roots

An orientation map, not a mixing or application recipe.

A name with a particular history

The modern Indian movement associated with this name is linked with Subhash Palekar. It sits within a wider history of farmers experimenting with local materials, ecological processes and cultivation suited to their surroundings. Contemporary natural-farming programmes are not all identical to the original formulation; training, institutions and practice combinations have continued to develop. The NITI Aayog training guide places these developments within the broader natural-farming landscape. [S01]

This book uses the full name when discussing the particular system and uses natural farming more broadly where the discussion warrants it. A field should not be classified from its name alone. A useful description includes what was grown, what was applied, how soil and water were managed, and how long those choices had been followed.

That description makes disagreement more productive. Two people may appear to dispute the same farming system while describing quite different practices. Recording the management gives them something concrete to compare.

The economic meaning of zero

Consider a preparation made with materials collected locally. It may save a cash purchase. Someone must still collect the ingredients, prepare the mixture, clean the equipment and apply it. If those tasks replace another operation, the comparison includes the work avoided. If they add to an already crowded day, that extra demand also matters.

The farm account therefore needs two views. The cash view records actual payments and receipts. The full-cost view also values family work, owned resources and the use of assets. Neither view cancels the other. The first explains whether the household can meet its bills; the second helps judge whether cultivation is rewarding the resources it uses.

Zero budget is best approached as a direction for reducing dependence on purchased cultivation inputs, rather than as an instruction to erase costs from the notebook. A claim of savings becomes stronger when the work has been counted honestly.

Four foundations that must work together

Beejamrit concerns the beginning of the crop: the seed or planting material and its treatment. Jeevamrit concerns farm-prepared formulations and the biological processes they are intended to support. Mulching concerns cover on the soil and the resources needed to maintain it. Waaphasa directs attention to moisture and aeration around roots. [SO1]

These are starting points for learning, not four independent guarantees. A good seed treatment cannot repair poor seed storage. A biological preparation does not make an unsuitable irrigation schedule appropriate. Soil cover is difficult to maintain if its materials have already been promised for fodder. Each choice depends on another part of the farm.

The next practice chapters follow that relationship. They explain what to observe, what to record and how to ask a useful question of a demonstration. Where quantities, handling or crop-specific decisions need a local recommendation, the training record should name that recommendation and its source.

Begin with what the field has

An honest starting inventory is surprisingly revealing. List the plots, the crops over a full rotation, water sources, equipment, livestock resources, available biomass and the people who normally perform each task. Add the periods when money and labour are most constrained.

The inventory is not an examination a farmer must pass. It identifies the support needed for a workable transition. A household without cattle should not be expected to pretend it owns livestock resources. A tenant needs an arrangement that fits the period for which cultivation is secure. A rainfed plot needs a different water conversation from a field with a reliable irrigation outlet.

- Mark resources that are genuinely available, rather than merely present somewhere in the village.
- Note their competing uses and the time required to obtain them.
- Check access during the season when the practice will actually be carried out.
- Identify who can help when the plan does not match the field.

This turns a general recommendation into a manageable set of decisions.

Learning through a season

A useful demonstration leaves the farmer able to explain the purpose of an operation. It also leaves a record of the crop, materials, date and observation. A photograph can help, but a photograph without the management record tells little about why a crop succeeded or struggled.

Learning plots should be chosen with the household. Their size needs to fit the family's ability to observe and carry the risk; this book does not prescribe one universal proportion of land. Keep a meaningful comparison where feasible and record any difference in irrigation, variety or sowing date. Otherwise the lesson may be attributed to the wrong change.

Meet after the difficult moments as well as at harvest. A delayed preparation, unavailable worker or blocked irrigation turn may explain the season better than an attractive final photograph. Training that welcomes those observations is more useful than training organised only to display success.

What the name cannot establish

A label does not establish the amount of food produced, the profit retained or the carbon stored. Those are outcomes. Research must ask about them separately and over an appropriate period.

Natural farming may reduce a purchased-input bill without producing a measurable soil-carbon gain in the same interval. Conversely, an ecological improvement may take time to affect sale receipts. Keeping these accounts distinct prevents an argument about one outcome from obscuring another.

A carbon claim adds further requirements. The relevant change, baseline, measurement and programme rules need to be established. Adoption of a named practice is evidence of an action, not by itself evidence of a tradable climate unit. The carbon chapters return to this distinction in practical detail.

The useful test

At the end of a season, ask the farmer to describe the system in ordinary words. What was bought? What was prepared? What was difficult to arrange? What did the field produce? What would the household do differently next time?

The answers reveal whether the approach has become usable knowledge. That is the foundation on which productive farming, ecological improvement and credible climate recognition must be built.

A name, a tradition and a defined treatment

Natural farming is a broad family of approaches. Zero budget natural farming identifies a particular approach associated with Subhash Palekar and the four foundations described here. NITI Aayog's training material places Palekar in its account of the development of natural farming in India. That history should be acknowledged without treating every natural-farming programme as an identical prescription. [SO1]

For a reader, the distinction becomes useful when meeting a farmer or visiting a demonstration. Ask what the person means by the name. Does the farm prepare the same formulations described in the training? Is there living cover, retained residue or both? How are water and crop protection managed? Has the system changed over time? These questions describe the work respectfully. They do not ask a household to prove loyalty to a label.

A research protocol needs a clearer description. It should state which operations define the treatment, which decisions remain with the farmer and which departures must be recorded. An operation can be locally adapted and still be identifiable. The difficulty begins when every variation is called identical before the outcomes are compared.

Three meanings of self-reliance

Self-reliance can mean that a household buys fewer materials. It can mean that the village provides a service previously obtained from outside. It can also mean that the farmer understands a decision well enough to make it without waiting for a salesperson or project worker. These are different achievements, and all deserve attention.

Suppose a farmer replaces an outside purchase with a preparation supplied by a local group. The household has changed its supplier; it has not necessarily begun making the preparation itself. The arrangement may be useful if the service is reliable and fairly priced. Its account should include the payment rather than describe the material as a free farm-made input.

Knowledge requires its own investment. A farmer who learns to identify a problem and ask for timely help has gained something not captured by the ingredient bill. Yet dependence can reappear if only one project worker knows the records or only one operator can maintain the equipment. Training should leave usable instructions, accessible records and more than one person able to perform essential tasks.

The practical test is continuity. What happens when the demonstration ends, the trainer is absent or the household faces its busiest week? A system becomes more dependable when its ordinary arrangements answer those questions.

Draw two boundaries around the farm

The first boundary surrounds the plot. It helps us ask what entered the soil, what grew and what left at harvest. The second surrounds the household and its supporting relationships. It includes materials from another holding, a shared machine, an irrigation arrangement and labour exchanged with neighbours.

Neither boundary is sufficient on its own. A plot can appear to use very few purchased inputs because another household supplied biomass without payment. A household can save money while its plot draws down a nutrient reserve. Writing down the two views makes these possibilities visible without deciding the outcome in advance.

Use arrows rather than a decorative picture of a perfectly closed circle. An incoming arrow needs a source; an outgoing arrow needs a destination. If cattle dung comes from a neighbour, identify that connection. If the farmer returns fodder or pays a charge, record it. If nothing is returned, do not invent a circular exchange to make the diagram look complete.

For research, the boundary should also specify the period. One crop is part of a rotation; one rotation is part of a longer relationship with the land. The farm account follows these periods separately so that a short-term saving does not quietly become a claim about permanent self-sufficiency.

What a useful training day leaves behind

A good demonstration should produce more than a group photograph. At the end, participants should be able to identify the materials, explain the intended purpose, describe the selected instructions and recognise when to seek advice. They should also know what has not yet been established about the operation.

The demonstration can follow the same sequence as ordinary work: arrange materials, prepare, apply, clean, record and observe. Allocate time to each. Ask the person doing the work to point out the awkward steps. Equipment that looks convenient on a demonstration table may be difficult to carry across a wet field or clean at home.

Before participants leave, agree the next observation and the person responsible. A telephone number is useful only if someone can respond. A printed instruction is useful only if the farmer can read it or have it explained in the language normally used for field decisions. The proposed programme should test these arrangements during its learning phase.

Questions that make a claim clearer

When someone says…	Ask for this next
“The inputs cost nothing.”	Which cash payments stopped, and which materials or work came from home?
“The crop looks healthier.”	Which observation changed, when was it recorded, and what is the comparison?
“The soil is improving.”	Which soil property, measured by which method, over what interval?
“The whole system works.”	For which crop sequence, household circumstances and set of outcomes?
“Carbon income will follow.”	Which eligible outcome and method, and which stages remain before a possible sale?

These questions are useful at an enthusiastic field meeting as well as in a scientific review. They allow a promising idea to become a statement another person can examine. They also make room for an ordinary answer such as “we have not measured that yet.”

A farm description to carry forward

Describe the farm in a short paragraph before comparing approaches. Name the crop sequence, water arrangement, starting management, source of major materials and people doing the work. Add the changes being considered and the outcome the household most needs to improve. The description should fit the actual farm, without borrowing the conditions of a successful demonstration elsewhere.

A farmer might prioritise a smaller cash requirement, another more dependable production and another the ability to complete work on time. These priorities affect the advice that is useful. Recording them also prevents a project from changing its definition of success after the harvest.

The comparison with organic farming now has a firmer starting point. Ask what each defined system requires and delivers in this setting. The following chapters carry that question into the field, the household account and the evidence needed for climate recognition.

What do we mean by better productivity?

Productivity relates an output to a stated resource. Yield per hectare describes land productivity for a crop and period. Output or return per day of work asks a labour question. Production per unit of irrigation asks a water question. They can move differently.

For a simple hypothetical area conversion, 2,000 kilograms harvested from half a hectare is 4,000 kilograms per hectare. It is not 4,000 kilograms actually harvested from that half hectare. Keep the original quantity and area alongside the calculated rate. A small measured section also should not be described as a weighed whole-farm harvest.

For several crops, report each physical output first. A rotation can provide an additional product even when one crop's yield changes little. Conversely, an impressive result for one crop can coexist with a difficult later crop. State the interval and area covered before calling the system more productive.

Quality and usable output matter as well. Total harvested weight, marketable weight, retained food and rejected material have different roles in the account. A marketable-output gain should be identified as such rather than silently substituted for total biological production.

The proposal in this book therefore uses several clear measures instead of one all-purpose score. The farmer can see crop output, cash and full-cost returns, work, water and ecological observations together. A carbon quantity has its own calculation. No one ratio should be asked to stand for all of them.

A short description is stronger than a slogan

A useful field description can fit on one page: the plot and period; crop sequence; seed and establishment; preparation and application; cover; water; protection; outputs; work; and unresolved observations. It should describe actual management in words the household recognises.

The description need not contain every laboratory measurement. Its purpose is to make the system identifiable and useful. Detailed evidence can be linked through plot, season and batch records.

At the next visit, compare the description with what occurred. Update it with a dated change where necessary. A farmer may have adapted an operation for a good reason. Keeping that reason gives both the household and the study a more useful account than insisting that the first slogan explained the entire season.

03

I · UNDERSTANDING THE SYSTEM

Organic farming and zero budget natural farming

For a farmer, the difference between two farming systems eventually comes down to work in the field. What changes before sowing? What has to be prepared or bought? Will the family have enough labour when it is needed? The answers matter more than the name printed on a bag of produce.

Organic farming and zero budget natural farming are often discussed as though choosing one means dismissing the other. That makes the choice harder to understand. We can make a more useful comparison by looking at what they share, where their priorities differ and what a farmer would actually do under each approach.

Where the approaches meet

Organic agriculture has a broad purpose. IFOAM's definition brings together the health of soils and people, ecological processes suited to local conditions, and fair relationships. Its four principles are health, ecology, fairness and care. [S02]

A farmer working within that approach may make compost, rotate crops, grow green manure or use biological crop protection. Organic standards can also allow approved materials from outside the farm. That permission tells us what is available to the farmer; it does not tell us what every organic farmer buys. [S03, S11]

Zero budget natural farming places a particular emphasis on reducing the need to buy cultivation inputs. Seed treatment and farm-made preparations are combined with soil cover and attention to moisture and air around roots. Local resources have an important place in the approach. [S01]

There is shared ground here. An organic farmer may also mulch, grow several crops and work to improve biological activity in the soil. Those practices do not belong exclusively to one system. To understand a difference, we have to go beyond the name and describe the management of the particular farms.

The Indian standard also makes the overlap concrete. The 2024 eighth edition of the National Programme for Organic Production describes diverse planting and nutrient recycling, rather than a system defined simply by buying organic fertiliser. Its crop and nutrient-management provisions include cover crops, rotations and farm-produced biodegradable materials. Permission to bring in an input is therefore a poor shorthand for the whole approach. [S11]

What changes for the farmer

Take the source of materials. An organic farmer may use what is available on the farm and, within the relevant standard, bring in permitted materials from elsewhere. The rules determine which inputs and practices are allowed. [S11]

Zero budget natural farming asks how much of the outside dependence can be reduced. That is an economic question as well as an agronomic one. A farmer needs to know whether local materials are available in sufficient quantity, what they cost to collect and whether someone in the household has time to prepare them.

Changing a few purchases is one possible step. Reorganising how the field is farmed is a larger one. Crop combinations, water and the handling of residues may all change. Either organic or natural farming can involve this kind of redesign. The comparison should give both a fair chance to show what they can do under good management.

That fairness has a practical meaning for research. We need records of the crops grown, irrigation, cultivation and the amount and source of materials applied. If livestock resources are used, those should be recorded too. Otherwise we could mistake the effect of one management choice for a difference between two whole farming systems.

The questions below help keep the comparison useful.

Question	Organic farming	Zero budget natural farming
What guides the work?	Ecological management under the relevant production standard.	Natural-farming practices adapted locally, with special attention to reducing purchased inputs.
Where do materials come from?	The farm itself and permitted outside sources.	Farm-made preparations and local materials; any outside purchases still need to be counted.
How do we judge fertility?	Record nutrient sources, crop removals and changes in the soil.	Use the same account. Biological activity needs to be considered alongside nutrient supply.
What goes into the cost?	Materials, water, transport, equipment and both paid and family labour.	The same costs, including the work of making preparations on the farm.
What is needed for a carbon claim?	A measured outcome that meets the relevant crediting requirements.	The same evidence and crediting requirements.

These questions describe what to look for on a farm. Its results will depend on how it is managed and on the conditions in which it operates.

Following the materials and the work

When a crop leaves the field, some of the nutrients used to grow it leave as well. A fertility plan needs to explain what returns to the soil and what has to be replenished. The discussion should include the amount of biomass available, the crops supplying it and the share already used for fodder or other purposes.

Measurements of soil and plant nutrients help us see whether that plan is working over several seasons. A good response in the first crop is useful information, but a farmer also needs to know whether the field can continue producing.

The costs need similar attention. Manure brought in from elsewhere has a source and a transport cost. A farm-made preparation requires ingredients and work. If we count every expense on one farm and treat the resources on another as free, the comparison will have little value to either farmer.

Timing can be just as important as quantity. Materials may be available in the village yet difficult to obtain at the right moment. Work that looks manageable on paper may coincide with an already busy part of the season. A training programme should help the household plan for that, including who will do the work.

Reading the studies fairly

One detail in a study can change how we should read its findings. In Duddigan and colleagues' 2023 experiments, the organic treatment used purchased organic amendments without mulch. The natural-farming treatment included mulch and farm-made formulations. All treatments used no tillage. The results apply to those choices; they do not tell us how every organic farm would perform. [S04]

Look inside the comparison before repeating its headline. The 2023 experiments used small, replicated plots growing a single crop; they were managed by designated natural-farming fellows. They were not a comparison of every feature of diversified whole farms. Mulch and several preparations changed together between treatments. A treatment difference consequently cannot identify the independent contribution of each preparation. Nor does calling a treatment organic establish that its produce held a particular certification. The methods describe management; certification needs its own evidence. [S04]

For a village discussion, ask someone to finish this sentence: “The study compared these practices, on these crops, in these conditions.” If those details disappear when a result is passed along, the message has become broader than the test. Keep the finding and its setting together. That makes a useful result easier to apply thoughtfully.

The later study of individual natural-farming inputs helps ask a more precise question: how much of an observed effect comes from a particular component? That is useful when deciding what a farmer should adopt and what needs further investigation. [S06]

In the proposed pilot, the organic comparison should be a credible local farming system. The conventional comparison should also be one that farmers actually use. We need to describe their management clearly and measure all of them with the same care. A convincing case for natural farming has no need of a deliberately weak comparison.

Certification income and carbon credits

A change of practice may come with several offers. Keep certification, crop prices and carbon payments separate.

- Certification establishes compliance with a production standard.
- A better crop price needs a willing buyer and agreed sale terms.
- A carbon credit needs a qualifying climate outcome, quantified and verified under the applicable rules. [S07, S11]

Certification alone does not establish a selling price or a carbon credit.

For NPOP, read the operator, products, validity and transaction records together. Its 2024 edition distinguishes the operator’s scope certificate from transaction certificates. A research treatment name or an input seller’s claim is not the farmer’s product certificate. Confirm the current requirements with the certification body. [S11]

An update also has a scope. APEDA’s 27 March 2026 notice sought comments on a draft; its 18 May notification brought an amended Annex 3(17) into effect that day. This annex concerns additives in processed organic food. It is not a list of field sprays. Read the operative document and the activity it covers before acting. [S54]

What is being offered?	Ask to see or explain	Keep a separate record of
A farming approach	The actual seasonal practices, inputs and support available locally.	What the household will change and who will do the work.
Certified organic produce	The named scheme and documents covering the relevant operator and products.	Validity, covered produce and any outstanding requirements.
A better crop price	The buyer, quality conditions and proposed purchase terms.	Ordinary crop income and any additional price still unconfirmed.
A carbon opportunity	The proposed outcome, accounting route and measurement responsibilities.	Costs and conditions before any payment can become payable.

Use these discussion questions when someone offers training, certification or a buyer connection. Bring the answers back to the same field and season. A certificate for one product does not cover every crop; a buyer conversation is not money received. Turn a training promise into a named service the farmer can use.

Keep ordinary crop income visible without assuming an unconfirmed premium or carbon payment. Show any proposed additional income separately, with its conditions and costs. The table is a discussion aid, not a completed application.

A lower cash bill still needs checking against production and family work. A better soil-health reading needs its own explanation; a climate result needs its own measurement. Clear distinctions help a family judge the offer.

Making a choice that fits the field

Before recommending a change, we should understand the farm as it is. The cropping year, available resources, expensive operations and household workload all matter. They help identify which changes can be tried and followed carefully while the family continues to meet its obligations.

Training should leave the farmer able to explain why a practice is used, what to observe and when an adjustment might be needed. The records should help with those decisions. They should be useful to the person cultivating the field as well as to the researchers studying it.

The case for zero budget natural farming will be strongest where farmers can see the difference in their own work, their earnings and the condition of their fields. This book sets out to understand those differences and the circumstances behind them. Where there is also a verified climate benefit, it argues for a credible way to recognise and reward it.

04

I · UNDERSTANDING THE SYSTEM

Benefits and the practical questions of transition

A recommendation becomes real when a household has to carry it through a season. Someone arranges seed, someone prepares materials and someone waits for the harvest payment. A farming transition should improve that life. Its value cannot be judged only from the enthusiasm of the training day.

The attraction of zero budget natural farming is easy to understand: less dependence on purchased cultivation inputs, more purposeful use of local resources and closer attention to the field. Evidence from some Indian settings gives reasons to investigate the approach seriously. It also gives reasons to ask which benefits travel to a new place and which depend on the circumstances of the farms studied. [S04, S05]

What can improve first?

The first visible change may be a purchase that is no longer necessary. The next may be a new task. Record both before calling the change a saving. A household may welcome a lower cash bill even where total work rises, particularly if borrowing is difficult. Another household may prefer an operation that costs more cash but fits its limited labour. These are different circumstances, not failures to understand the same advice.

Changes in field condition should also have their own record. Soil cover, water applied, crop establishment and the presence of selected organisms can be observed. Each needs a repeatable way of looking. General impressions are useful starting questions, but the comparison improves when observations use the same place, timing and method.

The possible carbon payment belongs later in the financial account, with its conditions visible. It should not be used to hide a cultivation plan that cannot meet the family's ordinary needs without an unconfirmed future sale.

A transition has a calendar

Write the coming season as a sequence of decisions. Place sowing, preparation, irrigation, weeding, harvesting and marketing on it. Add school expenses, livestock care and the household's other earning work where they affect the availability of money or time.

This calendar often reveals a difficulty that a list of annual totals misses. A task may take little time over the whole year but become impossible in the particular week when everyone is already occupied. Materials may be inexpensive yet unavailable just before sowing. Support should address the bottleneck that actually exists.

Decision point	What the household needs	What support should establish
Before sowing	Seed, materials, a feasible work plan	Availability, preparation guidance and a named contact
During establishment	Timely observations and water decisions	Visits or advice that arrive before a problem becomes severe
During crop growth	Work that fits the household's capacity	A response when labour, materials or management differ from the plan
At harvest	Reliable output and cost records	Fair weighing, quality records and a review of what happened
Before the next crop	A decision based on the season	What to retain, adjust, investigate or stop

Production cannot be assumed

Farmers need enough production as well as a reasonable cost. A lower bill is not a satisfactory explanation for a serious loss that the family cannot absorb. Equally, a similar harvest obtained with a lower cash requirement can be valuable.

This is why the proposed research must report crop-specific results and the whole rotation. A successful first crop does not settle nutrient supply for later crops. A difficult first season should be investigated rather than automatically attributed to a necessary transition period. Look at seed, weather, water, materials, pests and the timing of the change.

An earlier analysis by Smith and colleagues raised nutrient-supply and possible yield concerns, particularly for higher-input systems. It was an analysis of existing information, not a new field trial. Its questions should help shape local measurements rather than become a prediction that every natural-farming plot must fail. [S13]

The family doing the work

Ask who prepares the inputs and who controls the money saved. These may not be the same person. A change that appears inexpensive in the farm account may rely on work that is poorly recognised within the household.

Talk to the people doing the tasks, at a suitable time and with their agreement. Record paid work and family work separately. A group training event cannot substitute for understanding how a household will fit the practice into its day.

Tenants need particular attention. A cultivator may be willing to try a change but unable to commit land for a long monitoring period. An arrangement that rewards only the landowner can overlook the person paying for cultivation. Responsibilities, records and any proposed proceeds should be discussed before enrollment, using the actual tenure arrangement.

When a resource has another use

Residues illustrate the importance of asking beyond the field. A stalk may provide cover, fodder, fuel or a sale. Moving it into one use changes what is available for the others. A plan for mulch should therefore start with an allocation, not an assumption that all residues are free.

The same principle applies to cattle resources, water and shared equipment. Access can depend on another household, a service provider or the timing of a collective activity. Any charge and any work exchange should be recorded. A resource can be local and still be costly or contested.

This is also where a farmer organisation can help. It may coordinate training, equipment or records. Its usefulness should be judged by the service delivered and its cost, rather than by the number of people registered at the first meeting.

A market plan that can be checked

Growing produce under a particular system does not by itself create a higher selling price. Before putting a premium into an income projection, establish the buyer, quality expectations, volume, delivery arrangements, deductions and payment date. Compare the proposed route with the ordinary market option, including transport and rejected produce.

Certification and carbon transactions are different arrangements. Certification concerns conformity with a production standard. Carbon payments concern qualifying climate outcomes and a sale under the applicable programme. Neither should be described as money already earned because the farmer attended training. [S11, S07]

The booklet can therefore give readers a simple practical rule: make the ordinary crop account work first; show any additional, conditional income on a separate line.

A useful support promise

Support should be specific enough for a farmer to recognise when it has arrived. A named person will visit at an agreed stage. A material source will be checked before preparation. Records will be returned in language the household understands. A reported problem will receive a response.

These promises are more useful than a universal claim about profit or yield. They can also be tested. The proposed pilot should record missed support as carefully as missed farm operations; implementation is part of the explanation for the outcome.

Choosing the next step

At the end of the first learning period, the household should have a short account of production, costs, labour, field observations and unresolved problems. Decide together which changes deserve continuation and which need adjustment. A farmer who decides against expansion has still contributed valuable evidence.

For readers who came to this book to understand the difference between organic and zero budget natural farming, Part I has now provided the starting comparison. Both deserve to be assessed through actual management and results. The argument for natural farming grows stronger when a farmer can see a workable plan, useful support and evidence that fits the field. The chapters that follow examine the practices, the accounts and the proposed route from measured climate outcomes to legitimate recognition.

Put the household's question first

Before discussing adoption, ask what the household wants to change. “Spend less before harvest” is a different objective from “earn more per day of family work.” “Keep production dependable” differs from “obtain a buyer for a particular product.” A useful transition plan records these priorities in the farmer's words.

Choose a small number of outcomes that the household can review. One may concern the cash required before the first sale, another the crop produced and another a difficult operation. The research programme may collect more information, but the farmer should not need a technical report to discover whether the original problem improved.

Return to those priorities after the season. If the purchase bill falls but preparation clashes with another livelihood, discuss both. If production improves but only through unusual project support, show that dependence. The decision about continuing belongs to the household with the relevant evidence in hand.

A hypothetical decision before sowing

Consider a deliberately simplified example for one hectare and one crop. These figures describe no actual farm and are not a forecast of natural-farming performance. Suppose the present plan has expected output value of ₹80,000 and cash cultivation costs of ₹40,000. A proposed alternative has expected output value of ₹76,000 and cash costs of ₹30,000.

The difference is a ₹10,000 reduction in cash costs alongside a ₹4,000 reduction in expected output value. On these assumptions the return before valuing family work and owned resources improves by ₹6,000. Now suppose additional family work is valued at ₹4,000. The remaining improvement is ₹2,000 before any other changed costs. A headline about ₹10,000 saved would omit the rest of the decision.

What output would leave the household no better off on this simplified full-cost comparison? Existing return is ₹80,000 minus ₹40,000, or ₹40,000. Alternative costs are ₹30,000 plus ₹4,000 of additional family work. The alternative therefore needs output value of ₹74,000 to match ₹40,000. This is a break-even calculation for these invented assumptions. It is not an acceptable yield-loss margin for the pilot.

Hypothetical comparison	Present plan	Alternative plan
Output value	₹80,000	₹76,000
Cash cultivation costs	₹40,000	₹30,000
Additional family work relative to present plan	Reference	₹4,000
Return after the listed costs	₹40,000	₹42,000

Land, unchanged family work, fixed assets and financing have been omitted from both columns for this narrow incremental example. A real full account must include relevant costs consistently. Test different output and price assumptions before relying on the ₹2,000 difference; a modest change could reverse it. Chapter 10 develops the complete account.

Why annual savings may arrive too late

A plan can show a favourable annual total and still create a difficult month. Materials may need to be arranged before any crop income arrives. A buyer may pay after the household's next expenditure. A service can reduce annual labour but demand payment on the day when cash is shortest.

Write receipts and payments against actual months or operations. Include the earliest date a payment is required and the realistic date money may arrive. A hoped-for premium or carbon sale should not fill a cash gap without a real arrangement.

For the proposed pilot, record project-funded materials and free services separately. They are part of the support received during research. To understand whether a practice can continue, estimate what would happen if the household had to arrange that service itself, using an observed price or a clearly labelled unresolved cost. Free during a study does not establish free in ordinary farming.

Agree what happens when a crop struggles

Support needs an agreed response to a serious problem. Who can visit? Who may recommend a change? How quickly can the household obtain advice? What will be recorded if a rescue action is taken? These questions should be answered before sowing.

A farmer should be able to act to protect the crop without being asked to conceal that action for the sake of a comparison. Record the decision, timing, materials and cost. Researchers can then explain how actual management differed from the intended treatment. A favourable harvest after rescue may still be valuable to the household, while answering a different scientific question.

The project must be equally clear about financial assistance. No loss compensation or income guarantee is established in this proposal. If any assistance is later agreed, its conditions and funding need to be written and explained before reliance on it. Do not allow a helpful conversation to become a promise the programme cannot honour.

Ask what makes continuation possible

A farmer may complete the season successfully yet decide against repeating it. The reasons matter: a material was difficult to obtain, training arrived too late, another crop offered a better return, or the person doing the preparation had no time. These answers help improve the approach.

Do not code every decision against expansion as lack of awareness. First ask what the household encountered. Equally, continued participation does not establish that every part of the approach was beneficial. A household may continue because of training, social relationships or another service. Record the reasons without trying to force them into a success story.

A useful review separates what the farmer intends to continue independently, what depends on continuing support and what has been stopped. That distinction helps a farmer organisation decide which services are worth maintaining.

Make the first meeting useful to every participant

Ask the person preparing inputs about materials and handling. Ask the person supervising irrigation about water control. Ask the person selling produce about quality, deductions and payment. These may be different people, and a meeting with only one of them can miss the main obstacle.

Keep the record proportionate to its purpose. Explain why a question is asked and whether it is needed for cultivation advice, research or a possible commercial arrangement. Give the household a copy of the commitments relevant to it. A farmer should be able to identify whom to contact without searching through a project organisation chart.

The first meeting should leave a practical next action: inspect an available material source, review a crop recommendation, agree a baseline visit or examine a market offer. Attendance and enthusiasm are starting points. A clear, feasible action is what turns the conversation into useful support.

Five questions before expanding the area

- Can we explain the actual practices used and the departures made during the season?
- Do we know production, cash needs and family work on a comparable basis?
- Are the necessary materials and timely support available again?
- Have household members doing the work had a say in the decision?
- Can the plan stand on ordinary farming returns while additional payments remain conditional?

There is no universal score that makes these decisions for every family. A weak answer identifies work to do before expansion. A strong answer provides a reasoned basis for the household to choose the next step. This is the practical promise of the approach: a farmer understands the system well enough to judge its place in the farm.

Compare a buyer's offer after the deductions

A higher quoted price can still leave the household with less cash. Consider an invented marketing example for a 500-kilogram lot. The ordinary route buys all 500 kilograms at ₹20 per kilogram, giving ₹10,000. Transport and selling charges are ₹500, leaving ₹9,500.

A proposed route quotes ₹22 per kilogram but accepts only 450 kilograms. Its receipt is ₹9,900. Suppose its transport, sorting and selling charges total ₹1,500. Cash from this route is ₹8,400. The remaining 50 kilograms are still unsold at the comparison date, not mysteriously absent from the physical crop account.

These are hypothetical figures, not local prices or evidence that a particular premium market is unattractive. They show the questions behind an offer: quantity accepted, deductions, extra work, unsold produce and payment timing. If the 50 kilograms are later sold or used at home, record the actual event separately.

Hypothetical offer for the same starting lot	Ordinary route	Proposed route
Quantity bought	500 kg	450 kg
Quoted price	₹20/kg	₹22/kg
Receipt	₹10,000	₹9,900
Listed selling costs	₹500	₹1,500
Cash after listed costs	₹9,500	₹8,400
Quantity still unsold in this example	0 kg	50 kg

The cultivation comparison should retain the full output. The marketing comparison should retain the actual cash and the unsold inventory. A higher headline price is useful only when the full arrangement works for the household.

Follow the benefit to the person receiving it

An input saving can remain with the cultivator, pay a service provider or be offset by another expense. A market premium can be reduced by sorting and transport. A possible carbon receipt can depend on deductions and allocation. Trace each benefit rather than assuming that a favourable project total reaches every participant equally.

This matters within the household too. Someone may do more preparation while another person handles receipts. Ask how decisions are made and whether the work and benefit are understood by those involved. The project should listen without pretending it can settle every household arrangement through one form.

For workers, record changed paid work and task timing. A reduction in hired labour cost is a saving in one account and a change in paid opportunity in another. Report the distinction without treating the worker's experience as irrelevant to the wider benefit claim.

For neighbours and shared-resource users, ask whether the arrangement changes access to biomass, water or a service. A farm-level gain should not make an unrecorded transfer of cost disappear.

Food quality requires its own question

A cultivation label should not be used as a complete statement about the quality of every harvested product. If the programme wants to investigate a particular quality characteristic, define it, select an appropriate testing method and retain the lot identity.

Keep household food use visible. Record the quantity retained and the stated valuation separately from cash sales. Retained produce can be important to the household even though no money changes hands. Do not count it as a sale and again as a separate additional harvest.

Avoid health promises unsupported by suitable evidence. The useful farmer conversation concerns what was grown, how it was handled, what was tested where relevant and how the household uses it. This keeps the discussion concrete and allows genuine quality evidence to have its proper value.

A review meeting with a beginning and an end

Begin with the household's original priority. Then review the crop, cash, work, material and field records in that order or another order the family finds useful. Mark what is known, estimated and missing.

Choose a small set of next actions. A sowing delay may call for arranging material earlier. A weak market offer may call for checking another buyer. An uncertain observation may call for a better comparison. Not every problem needs a new technology or an expansion in area.

End with a readable decision record: what will continue, what will change, who will arrange the necessary support and when the next check will occur. Give the family its copy. This is how the booklet can serve after the first reading—as a guide to a conversation that produces a workable next season.

Take the conversation into the village

A discussion can begin with an ordinary question: how much money came from cultivation and how much remained? Then examine the practices, local materials and observations of soil and water. Discuss the carbon opportunity once the ordinary farming account is clear.

Do not choose a winner merely by looking at two fields. Ask about variety, sowing, water, previous management and the timing of the visit. A larger-looking plant does not establish the whole season's yield, return or carbon stock.

There is no need to choose a weak organic farmer to make the case for natural farming. A fair comparison with credible management is more useful. Where a difference has not been measured, say so.

After the conversation, a participant should understand a possible next step: begin a full account, ask better questions at training, inspect a material source or choose a learning area with appropriate local advice. Hearing the idea should not create pressure to convert an entire holding immediately.

This approach respects the farmer's experience. It allows the idea to travel while keeping the decision connected to the field, household and available evidence.

Your field notebook

These selected record guides accompany the four complete chapters in this booklet. They help a household discuss the work and observations before a transition. The full book contains the proposed research protocol and all twelve instruments.

Instrument A Participant and plot register

Use a participant code in working analytical records. Keep the contact and consent link in the controlled participant file. One participant can cultivate several plots; one plot can have a changing cultivation arrangement. Preserve those relationships over time.

Field	Entry or rule
Participant and plot codes	Stable identifiers; do not reuse a withdrawn participant's code
Village and location reference	Appropriate level for the working file and its access controls
Boundary version and area	Date, measurement/document basis and unit
Cultivation and tenure arrangement	Who cultivates, relevant duration and evidence status
Consent version and date	Link to controlled record; explanation and copy supplied
Cohort or treatment identifier	Actual allocation or match, with the decision date
Recruitment and eligibility trail	Frame, invitation, refusal/exclusion status and stated reason where appropriately available
Farm, assignment and observation links	Distinct codes for allocation unit, farm, plot, sample/composite and visit; retain higher-level grouping
Follow-up and correction	Date, author, old entry, corrected entry and reason

Before accepting a plot record, confirm that its area and identity match the field team map. Check that the person providing information can explain the cultivation arrangement. Refer unresolved rights questions through the reviewed process; do not decide them in the data form.

Keep assigned condition separate from actual management and support received. Link the allocation procedure/version/date or the matching decision; do not reconstruct original allocation from current practice. A nested sample or later visit does not create a new assigned farm. Record revised access or participation without silently replacing the original series.

Link the purpose and scope of each participation permission to its controlled record. Research participation, field access, identifiable photographs and later contact need their actual reviewed basis; one signature should not silently stand for them all. Record changed participation, its effective date and the response required under the actual arrangements. Preserve the history without inventing a right to retain or disclose information.

Instrument C Seasonal operation and labour log

Use one operation row with date, plot, crop, operation, material batch, quantity/unit, worker code or appropriate group, hours, paid amount and other cost. Link receipts where available. Record deferred payment or exchanged resources explicitly.

At each review, check that activity dates fit the crop calendar. Ask about work that was performed but not written down. Keep reconstructed entries identifiable. Separate training time, setup and recurring work so that the actual transition year remains visible.

Keep the worker or consented group, actual hours and required operation window distinct. Add paid/unpaid/exchanged-work status, payment date or amount still due, and any separate valuation basis used in analysis. An imputed labour value is not a wage receipt. Reconcile shared-operation allocations with the total time recorded.

Instrument D Preparation batch record

Record formulation version, ingredient source and quantity, collection and mixing dates, container identifier, responsible person, required preparation conditions and application/disposal. Link every receiving plot to the batch and applied amount.

Use the locally reviewed preparation instruction. Do not replace an unrecorded quantity with the standard recipe after the event. If actual practice departed from the instruction, that is part of the evidence.

For seed operations, link the seed lot and any divided portions, existing treatment, reviewed compatibility decision, handling date and sowing record. Keep the original counts, denominator and observation date for establishment checks. For material accounts, distinguish original preparation from added water, prepared from delivered quantities and wet from dry measurement bases. Identify leftovers, rejection and the destination of each transfer.

For a component comparison, record the actual omitted operation, the retained operations and any reviewed carrier-water or handling comparison. Keep application equipment and relevant plot traffic identifiable. Link departures and rescue work to the comparison; the batch name alone does not define the treatment.

Instrument H Harvest and farm account

Record each harvest collection with plot, crop, actual area, weight and moisture basis. Allocate output to sale, household use, seed, fodder, loss or other use without counting a quantity twice. Record actual sale price, grade, deductions, transport and payment date.

The cash account uses actual receipts and payments on its stated basis. The full-cost account adds declared valuations of non-cash output and resources. Reconcile internal transfers before consolidating the whole farm. Keep premium and carbon scenarios separate from realised revenue.

Separate harvest, sale and receipt dates; identify unsold stock, receivables and unpaid bills. Preserve the quantity and basis for retained output, family work, land and owned resources. Identify financing cost, debt principal and asset purchases separately. Do not count loan principal as another input purchase or charge both the full asset purchase and its depreciation to the same production period. Reconcile shared-cost allocations to their original total and retain the common period/area for rotation comparisons.

Keep each crop and enterprise output separately identifiable, with area/arrangement, occupation dates, quantity, quality basis and destination. Retain original quantities beside any value-equivalent or land-productivity calculation; identify prices/comparators and the period used. Do not treat an aggregate as a physical harvest of its reference crop.

Link the harvested crop area and occupancy dates to the physical plot/holding register. Label any total of crop occupations across seasons separately from physical land area. When consolidating enterprises, reconcile internal product/material transfers so they do not become a second external sale or purchase. Preserve the outcome's denominator and accounting period.

Keep a confirmed zero harvest, an unmeasured harvest and no sale distinct, with the observation or report supporting each status. Retain other produce, rescue work and costs even when the focal harvest fails. Link missingness and any analysis-use decision to Instrument J; do not turn an unknown quantity into zero.

Instrument I Ecological observation

Choose the indicator and protocol before observing. Record plot, location, date/time, observer, instrument or survey method, effort, recent weather and relevant management. Store the original observation, derived indicator and any quality flag separately.

A missed visit is missing, not zero. An uncertain species identification should retain that uncertainty. A field photograph should have a date, location reference, consent where needed and an explanation of its evidential role.

For each reported ecological claim, link the original observation to the derived quantity, analysis version, relevant comparator and uncertainty. State whether it is descriptive, associative or intended as a causal estimate. Keep survey effort/effective area separate from the physical holding and carbon-project boundary. A service claim and a carbon-eligibility claim need their own evidence trail.

The full book's Instrument I adds linked visit, observation, review and analysis fields.

Instrument L Farmer statement and payment record

Give the household the season, plots, work recorded, production, cash costs, full-cost basis and main observations. Explain unresolved entries and allow correction. For a payment, show the actual payer and recipient, gross basis, deductions, amount, date and transaction reference.

The farmer statement should also identify the contact for a question or dispute. It is not useful if the household can neither read it nor obtain an explanation.

Classify each entry as cultivation receipt, work/service payment, reimbursement, realised carbon proceeds or other identified support. Retain estimate/agreement/payment/dispute status as supported by the actual record, with payer, recipient and the relevant condition. Do not present an imputed saving or expected receipt as a payment. Explain the gross-to-net calculation and check deductions against costs already paid elsewhere.

Link the entitlement or payment basis to the actual terms and funding source. Keep eligible, approved, due, transfer-instructed, paid and disputed states distinct where applicable. Preserve transfer evidence and corrections; reconcile each deduction through one expense identifier with any grant, prior invoice or other payment covering it. Distinguish a prepayment's later use from a fresh charge or cash refund. A proposed reserve needs its purpose and actual authority; a failed sale does not itself establish which obligations disappear.

Record the statement's version, return date, explanation and unresolved correction; receiving a copy is not agreement with its contents.

A few useful words

Zero Budget Natural Farming: A particular farming approach emphasising reduced dependence on purchased cultivation inputs, farm-prepared materials and connected ecological management. Zero budget does not erase labour or resource costs.

Organic farming: An ecological approach whose certified production is assessed against the applicable organic standard. It is broader than replacing a synthetic input with a purchased organic one.

Beejamrit: A farm-prepared seed-treatment formulation associated with the approach. Its preparation, handling and crop suitability must be documented through the selected guidance.

Jeevamrit: A biological formulation prepared for farm use. Its name does not establish a universal nutrient replacement or a carbon-removal rate.

Mulching: Maintaining suitable material or managed living cover on the soil. Record its type, timing and competing material uses.

Waaphasa: Attention to moisture and aeration in the root environment within natural farming, translated into crop-specific observation and management.

Sources and evidence notes

S01 · Empowering Farmers Natural Farming Training Toolkit and Best Practices Guide

NITI Aayog · 2026

https://www.niti.gov.in/sites/default/files/2026-03/Training-Manual-English.pdf

Official natural-farming concepts and terminology; documented practice descriptions.

Guidance is not a primary field experiment. Do not copy categorical comparator rankings or untraced quantitative benefits as universal findings.

S02 · Definition of Organic Agriculture

IFOAM Organics International · 2008 definition

https://www.ifoam.bio/why-organic/organic-landmarks/definition-organic?result=5

Organic agriculture includes ecological processes and social principles; not merely purchased-input substitution.

A normative definition does not establish the performance of every organic farm.

S03 · What is organic

IFOAM Organics Europe · Undated

https://www.organicseurope.bio/what-is-organic/

Organic systems and principles extend beyond input avoidance.

European regulatory details are not transferred to India. Do not repeat health or numerical outcome claims without underlying studies.

S04 · Natural farming improves crop yield in SE India when compared to conventional or organic systems by enhancing soil quality

Duddigan et al. · 2023

https://link.springer.com/article/10.1007/s13593-023-00884-x

Context-specific yield and moisture findings. Yield comparison uses within-experiment z scores; changing farms and crops constrain temporal interpretation. No significant treatment effect on organic carbon or bulk density over the study period. Moisture probe depth and sampling occasions, hand-sorted earthworm count support and conditional biomass collection delimit the ecological observations.

Not a long-term transition panel, physical yield forecast or all-organic comparison. Organic plots lacked mulch; all treatments were untilled. Farm, experiment and available-yield counts differ; complete data/model reconciliation remains open. Small monocrop plots do not test diversified whole farms or establish certification. Earthworm ecological/age groups were not recorded; abundance alone does not establish microbial activity or an ecosystem service. Study dimensions are not a pilot SOP.

S05 · India’s agroecology programme Zero Budget Natural Farming delivers biodiversity and economic benefits without lowering yields

Berger et al. · 2025

https://www.nature.com/articles/s41559-025-02849-7

Programme-specific economic and bird-abundance findings in northern Andhra Pradesh. Modelled responses vary by bird feeding group and species; selected guild estimates and uncertainty intervals are reported in chapter12.

Matched observational programme evaluation, not a census of all biodiversity. Selected main/supplement sections inspected; no full supplement or raw-data/code replication, measured crop-protection service, whole-India effect, carbon issuance or soil-removal result. Site selection, outcome-specific matching and balance diagnostics are different stages. Exact crop variety was not verified; common seed-supply timing supported an author assumption. Figure7 field-profit title versus harvest-count caption remains a reporting question. No raw-data/matching/code replication or confirmation that all confounding was removed. The chapter12 invented two-visit example cannot identify population/density change or estimate unseen birds. Effective survey area is model-derived for the observation process, not a farm boundary.

S06 · Quantifying the contribution of individual inputs used in Zero Budget Natural Farming

Duddigan et al. · 2024

https://bsssjournals.onlinelibrary.wiley.com/doi/full/10.1111/sum.13126

Two-season within-package omission trial: main-crop yield and measured-process findings answer different questions.

Not a new organic/conventional comparison, proof of synergy or long-term nutrient sufficiency. Full supplement and raw-data/code review remain open. AppendixS1 Tables S1–S12 remain unread after bounded cycle 12R retrieval attempts; no supplementary findings inferred from the file listing.

S07 · VM0042 Improved Agricultural Land Management v2.2

Verra · Active since 21 October 2025

https://verra.org/methodologies/vm0042-improved-agricultural-land-management-v2-2/

Relevant framework for agricultural mitigation and the need for baseline, additionality, quantification and uncertainty assessment.

Selected requirements include material-leakage clauses. Full methodology, corrections, programme rules, linked tools and project evidence still require review. No farm or proposed pilot is declared eligible.

S08 · Corrections and Clarifications to VM0042 v2.2

Verra · 11 June 2026

https://verra.org/wp-content/uploads/2026/06/VM0042v2.2_CC_11JUN2026.pdf

Current v2.2 applications must account for the published corrections.

Selected baseline and remeasurement requirements explained within the recorded inspection scope. Complete programme, tool, sampling and project evidence review remains open.

S11 · National Programme for Organic Production Eighth Edition

APEDA Government of India · 2024

https://npop.apeda.gov.in/sites/default/files/2024-10/NPOP_Eight_Edition_2024.pdf

Organic crop management includes diversity and nutrient recycling. The inspected edition distinguishes operator scope and transaction certificates and identifies certified products; certification and a research treatment name have different evidentiary roles.

Selected 2024 clauses and scoped S54 update inspected; complete current amendments, certification/application, conversion and input-permission audit remain open. No farm, input or product declared eligible or certified.

S13 · Potential yield challenges to scale-up of zero budget natural farming

Smith, Yeluripati, Smith and Nayak · 2020

https://www.nature.com/articles/s41893-019-0469-x

Literature/simulation analysis distinguishes low/high-input settings, nutrient constraints and possible soil restoration. Not a new harvest trial.

Literature/simulation with a national fertiliser-application comparison, not a local nutrient-requirement measurement or harvest trial. Supplement calculations/model code not independently reproduced; no universal loss rate or locally validated forecast adopted. New annual ledger is an invented teaching example, not source data.

S54 · Amendment of Annex 3(17) of the NPOP 8th Edition

APEDA, Government of India · 18 May 2026

https://apeda.gov.in/sites/default/files/announcements/Notification_on_amendment_Annex3_17_NPOP_8th_Edition.pdf

Distinguishes a draft consultation from an operative amendment, effective 18 May 2026, covering additives in processed organic food.

Selected notice and annex scope only; no complete amendment, food-additive permission, field-spray approval or individual certification audit. Current applicability must be checked for the actual activity.

The next step



Moong seeds and a trifoliate sprig. An original illustration of an Indian crop, not a documented farmer encounter.

Continue with the full book for the practice chapters, economics, ecological assessment, carbon-recognition proposal and proposed pilot.