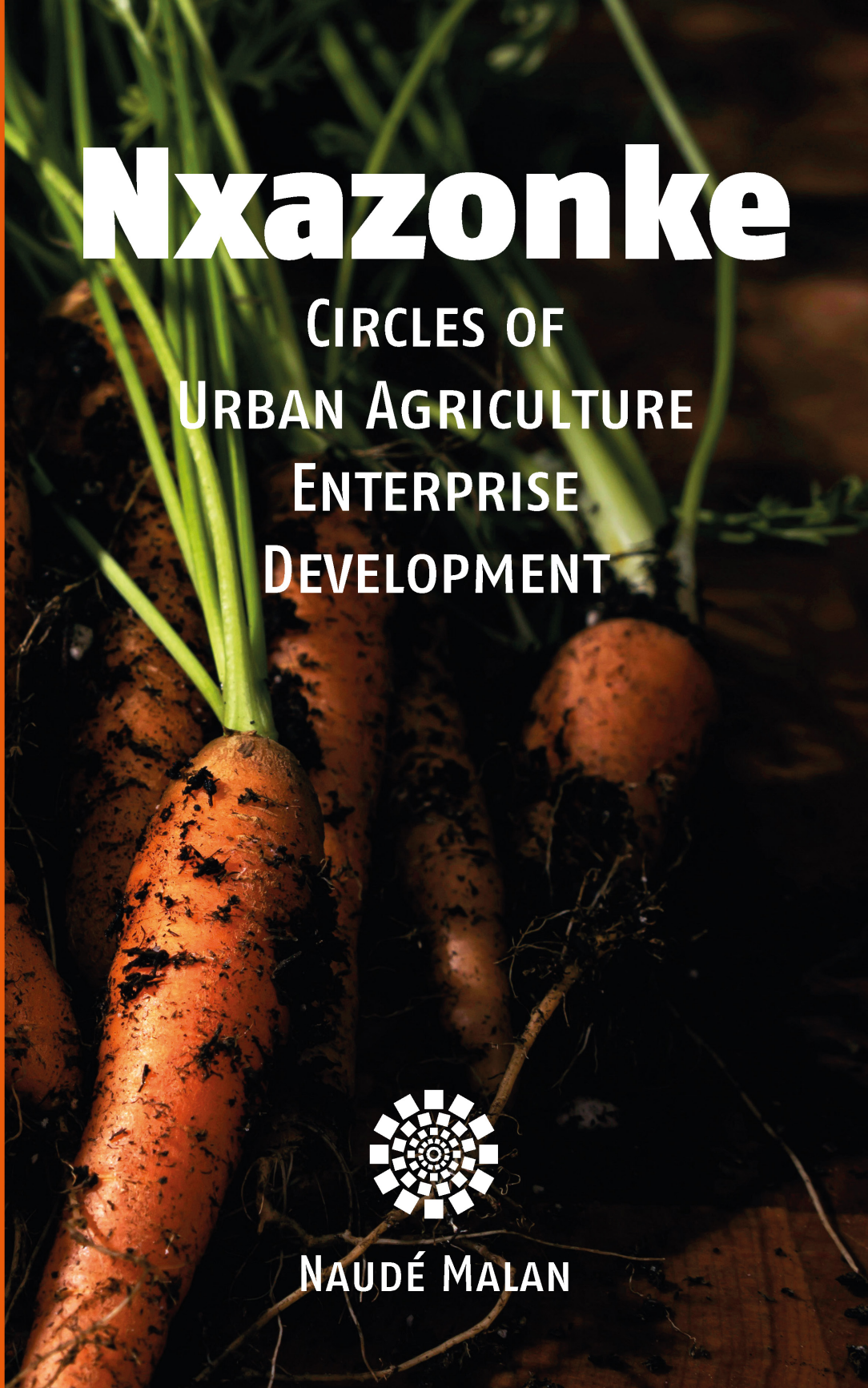

Nxazonke

Circles of Urban Agriculture Enterprise Development

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This book is dedicated to those who inspired me to write it. This includes many urban farmers, and I am grateful for being guided by their practices.

I also dedicate this book to those I served with on the Council of the Agricultural Research Council of South Africa, who gave me a "vuurdoop" in governing agriculture in South Africa.

There are also those who are fighting for a more just economic and social system, and their teachings was and is, as always, a great inspiration.

Having said that, I must take responsibility for putting all of this together.

I am fully aware that I will disagree with those who inspired this book.

No artificial intelligence was deliberately used in writing this book.

I arrived here just in time …

Chapter One

Introduction

A cooperative in Soweto farms a garden at an old, small and disused primary school. I will spend some of my afternoon here advising them on how to make the most of two tunnels donated by a state department. The farm is typical of the kinds of farms or gardens that one would encounter in Soweto, and perhaps in any township in South Africa, or in any settlement at the fringes of the modern city in the developing world. The group uses makeshift technologies and practices to farm a very small site. The size of the land means that they would have to be extremely productive to make a good living out of it. Urban agriculture has to be built on this fundamental realisation of the smallness of the enterprise. They need an approach to enterprise development appropriate to this smallness of this site.

The members of the cooperative are all very happy to see me. I know many of them from *iZindaba Zokudla* and I relish the opportunity to see people actively farming in the city. However, I feel the demands that these visits make on me. I have a stack of marking to do at home. I am sick with flu that I cannot shake. Doing this kind of work is demanding. I have to leave early today, and I feel completely guilty for having to do so but have no choice. I wonder if the cooperative will ever receive the right advice and embark on the right courses of action to make the most of the precarious and small space available. It would be possible to farm successfully here, but it would take a lot of effort, the right technology, and a really strong spirit. They have a strong spirit. I know that there are many others aiming to help them with the garden and I find myself compelled to critically interrogate advice given to them. I realise that these farmers are beset from all sides with advice and recommendations by those

proffering an "organic" agriculture, those offering advice on "conventional" methods, and many different kinds in between!

It is at this point that I realised that urban farmers do not have the same interests and aims for their own development as development agencies may have. I noticed the dissonance between advocating for "organic" agriculture and the complexity of gaining a livelihood for those practicing it. I wish that we can develop learnings on organic, regenerative, permaculture, low external input agriculture, etc., towards its competitive niche and place in the current food economy, wherever it transpires. It does not matter if urban agriculture is practiced for necessity or to generate a steady income. What matters is that many are and will practice it, and this practice can be refined and enhanced, and we who can, should do all that is necessary to solve the "puzzle" of how to make it worthwhile. The practice itself, on the farm, in how we structure it, must be able to generate the net value needed to build bigger and more capable systems on top of it.

One part of my realisation was that we would have to develop the whole of the human endeavour that these urban farmers are occupied with to make them successful. This

includes their retail competencies as we develop their abilities to produce food. I realised that urban agriculture necessarily would emerge in a context where wastes as inputs are available, and this could change the way that it functions in a market context. Organic waste enables almost anyone to "produce" by "repurposing" it as an agricultural input, or other wastes can be sold as recyclables, generating cash for farming. The farms will be small, and the total integration of everything on the farm, from labour productivity, inputs, technology and sales are crucial to solve this puzzle. I am aware that technology could be developed as a high or an appropriate or intermediate technology, and hence urban farmers should both devise and select technologies that suit their interests and strategic aims. Technology and design could multiply efforts and could make employing people worthwhile. I was encouraged by the recent proliferation of social media, and this accessibility opens up avenues for the further development of markets and customer bases. I combined these insights and developed a complete framework wherein urban agriculture would have a chance of succeeding. Of course, the whole of all the activities described here have never been implemented as envisaged. However, I have encountered truly exceptional farmers, and I have gleaned much from them. They gave me the courage to embark on this project to write this book.

I thus realised that urban farmers may not have been given sufficient means to truly establish viable enterprises, and in this sense, I do take exception to those who do not offer them a comprehensive solution. If we want to promote urban agriculture, we need to investigate, explore and experiment with all possible means to do so. It may be coincidental that urban agriculture could thrive on urban wastes. In a sense, the plant-animal synergy that is the basis of life on earth is repeated in agriculture. However, the success of the urban agriculture enterprise is not only in acknowledging this synergy, but in actively constructing progressively more productive agro-ecological cycles on a farm, and enhancing this with technology. This metabolises the wastes, and this metabolism creates much of the sustainable impacts of this form of the enterprise can make. It provides some legitimacy for this endeavour, but note

that the net positive material production of the farm makes these achievements possible. To build in waste repurposing, food security, or regenerative agriculture, we have to create a material base that realises these. I hope this can be achieved by what I describe below.

We need to highlight the functioning of the enterprise in our efforts to develop it. We can structure an enterprise to realise key social objectives. Highlighting the functioning of the enterprise seems much more aligned to the interests of local farmers, who would carry responsibility for these outcomes, which is crucial. This could realise distant and abstract objectives, like the Sustainable Development Goals (SDGs), but under the control over those who need these goals to be realised the most. We need to highlight the functioning of the enterprise and not the key outcomes of our intervention, as the enterprise is the means to achieve normative ideals, be they the SDGs or "organic" agriculture. We need to innovate in the key overlaps between the functioning of the enterprise and the tools, means and ends of sustainability.

How the ecosystem functions can structure an enterprise and drive its competitiveness, particularly a farm. Sustainability, and its recommendations, addresses resources, their use and circulation. In the background stands the inherent productivity of the ecosystem. Within this paradigm, the opportunity exists to substitute industrial processes with natural ecological processes. Substituting industrial inputs with biological processes will give urban agriculture a key advantage, and link its development with the health of the ecosystem and the broader urban system. Urban agriculture could productively be partially de-linked from global input markets, and be linked to the urban waste stream. This advantage needs to be exploited further, and this base ecological productivity needs to be sustained throughout the value chains that move through the urban agricultural enterprise. I try to synthesise this into a coherent framework, accessible to anyone. It is aimed first of all at urban farmers. Academics and researchers would have an interest in the recommendations in this book, and I also write for them, and please note the change of "voice" throughout

this book. Those who aim to help them, like me, should realise that our efforts should be guided by them, but also that we must radically innovate. However, I developed these ideas first of all to fit in with the material and social challenge of food production in an urban area. I did not do this to fit in with any particular theoretical point of view, approach to assistance, or normative ideal. I must note that it indeed is critical social theory that lies behind this book: a creative attempt to change and overcome the world and not only to understand it.

The approach taken in this book is to consolidate diverse and fruitful approaches into a sensible whole. We need to overcome the fragmented nature of the advice that urban (and many small) farmers receive, no doubt clouded by the diverse and often contradictory aims that we want them to realise. Our advice and support must aim to protect their strategic interests – to be able to deliver food at competitive prices in ways that build the resilience of society. Their practices often are similarly fragmented, be it through fragmented advice or through ignorance of proficient biological production practices. We should note that local, biologically based and sustainable agriculture has not been systematised as scientific knowledge, and an alternative to "conventional" agriculture is still nascent. It may be that we need to embark on a grand research programme to develop local, biological and sustainable agriculture anew, and we should expect small farmers to lack reliable support for their strategic interests. It is still necessary to properly validate this approach through scientific means. We need to find someone who will implement all these recommendations so that we can properly test it.

Underlying the ideas in the book is to construct a circular system of resource regeneration by repurposing waste and linking it to enterprise design. This is how the ecosystem functions, and a small farm needs to emulate these cycles and construct interlinked systems of biological production. These can link with the further processes of the enterprise, like customer engagement, and here a waste harvesting system can be constructed. In this way, wastes are repurposed as

inputs, and it is in the interaction amongst these cycles that productivities emerge, and which eventually delivers a product.

"*Nxazonke*" in my broken vernacular, means "all around" and this hints at the opportunity which we have to build highly intensive and sequenced circular production systems for urban agriculture. Because of the closeness to the place where wastes are generated, waste repurposing becomes a keyway to increase competitiveness and productivity, and this reorients the ways in which the enterprise would function. Closeness to the place where food is sold (and access to high retail prices) is the other side of the competitive space that urban agriculture can command. This is operationalised as a four-fold approach that focuses on producing food highly intensively (mainly through deep trench beds). Secondly, it focuses on retail sales with the opportunity to lower food prices by waste exchange. The development of a retail presence in an urban agricultural context is key to achieving profitability. Thirdly, technology development and design can enable high productivity and enable labour to be create net value and better workers and working, and we need to focus on this. Fourthly, we can use social media as a means to promote the business and to reconfigure customer

behaviour, perhaps the most important part of the whole endeavour, and this completes a full enterprise development approach, appropriate to the smallness of these enterprises.

Urban agriculture has interests in a new kind of food system that eliminates intermediaries and is able to develop a new retail and production reality (farmers as producers and retailers) that is at yet unrealised. Hence, the recommendations that are made here go beyond the mere affirmation of small farmers, and beyond the misplaced recommendation that we need to "find markets" for them, as they live and can produce from within these markets. Global agricultural markets are well-defined and developed, and this really refers to the fresh produce markets and subsequent supermarkets, which are not appropriate to an urban farmer. Wholesale prices are too low for a small enterprise to depend upon. To make ends meet, an urban farmer has to be both a producer and a retailer.

I often take exception to the idea that the market has to be made available to urban farmers. Urban farmers need to take the lead in efforts at "developing" them, and it is through their experimentation and implementation of ideas that the sector will grow. I take exception to those who prescribe how such farmers should operate, and ideas of organic production and sustainability should be devised to enable farmers to thrive, and not be employed to achieve distant and first-world objectives. Sustainability could be a burden or an unlocking of potential; it depends on how we construct it.

The Sustainable Development Goals are often mentioned as key in directing change efforts and realising a better world. To get to know more about them, take a look at: https://sdgs.un.org/goals, but search for them on the Internet to gain a complete picture. Some have disagreements with the goals but note that these will shape policymakers and corporate agendas and you as an urban farmer will be influenced by that. However, these goals are distant objectives, and here we are promoting the idea that these goals can be realised by the internal design of the urban farming enterprise. These are goals and not means to develop an enterprise.

In this book, a key focus lies on food and recyclable waste harvesting. This is operationalised through a food-for-waste price reduction mechanism. Many other aspects of the enterprise are designed around the opportunity that urban farmers have for waste harvesting and to exchange this for food. The design of this mechanism will realise some of the aims of the SDGs. Hence, the internal operations of the urban agricultural enterprise, and how it links to society, are key in realising these higher-order goals. This means that we need to design for these goals in the way in which we develop these enterprises. This book details this opportunity and shows how this can be accomplished. It places this in a deeper critique and assessment of the urban food market and shows how these emergent enterprises can realise goals that have value for society. However, these must be realised in a way that supports the farmer, and the aim of this book is to find a way to support both.

Urban agriculture must create new markets through the way in which products and services are designed, and with that, create a new enterprise form, not only to thrive, but to achieve a kind of sustainability, and all this is within reach today. Academics have emphasised that urban agriculture can feed cities with fruit and vegetables provided that 30% of urban land is devoted to food production. This is the cue that this book takes and offers a creative solution that secures the functioning of the urban agricultural enterprise through its enterprise design. In these pages, we find a broad developmental programme and business plan for urban agriculture, as a means to transform this marginal practice into a modest but sustainable livelihood for urban farmers and retailers.

At the garden site that the cooperative occupies, we see new tunnels – courtesy of the local state representatives responsible for agriculture. They donated a healthy load of artificial fertilisers, which will no-doubt deplete the soil of life and lock subsequent production into expensive artificial inputs. This illustrates the (well-meaning) presuppositions of their strategy: Add water, fertiliser and the tunnels and progress will emerge… The path to enterprise viability is likely to involve all

aspects of enterprise design. Once I realised that urban farmers are not able to sell this produce effectively, a solution started to emerge. It is in the selling of urban agricultural produce where the real opportunities lie. Hence, I will take an urban farmer through a journey where sales and production are integrated with production, where marketing and social media is employed to sell produce, and where produce can be sold at a price that is competitive with supermarkets.

The site that I am visiting is not well-kept. A leaking tap has created a small rivulet in the garden, wasting a lot of water. It flows into another rivulet from a blocked drain from the next house on the site, with the milky tepid soap-stained sewage mixing with the clear leaking tap to only disappear in the garden, the nutrients of the sewage unutilised. A few bulrushes have made a home next to the sewerage line, indicating the rivulet's age. There are lots of branches, dry weeds and grass lying around. The gutters of the school are broken but no sign of water-harvesting nor contours to catch and trap the water. It looks like nothing special has been done at all. I am concerned by this. But they now have a tunnel…

The philosopher, Iris Young, in her last and perhaps most important work, shows us that positive changes in society, even justice itself, has to be accomplished by those who need it the most, often the most powerless. This is an important statement, as I have witnessed countless attempts by some to assist others. It reminds me of the futility of helping someone, and how personal assumptions and presuppositions influence this. When some help others, it is more often than not an attempt to enrol them into someone else's attempt at world-making. That is why we see the "poor" being used all the time by state, civil society and business actors to complete their projects for them. The SDGs can inadvertently become such a magnet for good intentions. Even though we are compelled to help the poor and powerless, they often exploit such support to complete their own projects, just as we do to them. This may be to perpetuate receiving this help… An unkempt garden is a sure sign that a garden is farming donors and not food…

Donors often disregard their own failings through a "the poor-are-incapable" rationalisation, and this is where the real danger lies: we recreate the poor in an image of someone who will need our help. This is the basis of a larger strategy to make the world into a certain image. When we do this, we enter a larger arena of contestation, and that is to defend this world against all other possible worlds. From here, it looks like those who win this contest will take it all, and, hence, we prepare ourselves to do so as well…

We forget that we ourselves create this zero-sum game. We do so by paradoxically trying to "relieve" poverty and push this image forwards at the expense of all others. Real structural change in society is left behind in this calculation. We often aim to address these things directly, often with pertinent technology (like a tunnel), whilst all solutions need to go through the long road of society… and recreate institutions and society itself for sustainability… We should rather focus on why the poor cannot keep the little that they do earn. No one is completely powerless… Their struggles – everyday struggles – and the gains from these need to be protected. How can we then pin our hopes for transformation on the abilities of those most unable? Is this not the paradox of helping others?

The farmers have tunnels, and they asked me to come and advise them on what to do with them. Where do I start? The water that leaks make me very uneasy. Tunnels will only benefit you if you are able to look after the garden before you received them. I would recommend deep trench growing beds and some kind of contouring of the slope in the tunnels. (They in fact did so afterwards!) Technology is not a quick fix. We all know this. The "farm" has no name displayed, indicating that even if they could miraculously produce something special, no one will know who did so… and may not (repeatedly) come and buy… The basics of an urban food enterprise is not there…

In my mind rings the realisation that much more is at stake than the garden, and that the success of the garden lies outside the garden proper, in a changed system of food production and provisioning. The trick is to develop the right narrative that can motivate people to overcome the oppression of the past, to seize current opportunities, and to know how to link these with other narratives and practices to create a system that is productive, equitable and durable. A society that does not recycle will not be able to protect children. What we need in society is one unbroken chain of good deeds, from helping the poor through charity to living our own lives consistent with the progressiveness of helping others to be radically active and innovative. Throwing bread on the water is only necessary when people cannot build value in their own lives. This would be building houses, becoming healthier, saving money, making things, learning new things, working productively with reward and living well in safe, secure places.

Struggling to build a working business, a system that outputs more than its inputs, is one such site of struggle. What investments can the poor make in their own endeavours, and are we able to protect these innovations? This particular form

of the enterprise is a necessary and complicated milestone that we need to achieve as a society if we are to relieve poverty. It should be possible to build such an entity, and we need to focus efforts on this. We should be protecting what the poor are building and follow their own efforts. At the bottom, we need to ensure that the ecosystem can produce its services for free, so that we can build on these. These gains need to be protected, and it is in protecting the gains of the poorest, that the mark of a progressive society lies. The beggar is unable to keep the gains that he has made; they have no house to invest their rent. There is no garden to produce food nor a fridge to keep it. They are unable to protect their health as they cannot influence the quality of water that they drink. They are unable to participate and contribute to a good society. They are unable to fit themselves into a positive change process. To do this, we must make available the materials and tools for the poor to build durable systems that promote their own interests. The relief of poverty lies in all our interests.

We are all enrolled into inequitable processes in society. By simply buying the wrong things, we make an impact. We need to create opportunities for the social contract to be re-written. I offer this as a way for development agencies and state departments to relax the control that they want to have over development and change and rather focus on protecting people's own actions to realise these changes. Best trade is when the value that the product or service brings is consistent with society's functioning. That is how any business becomes "successful", when there are consistency and integrity between the manufacture and use of a product and/or service and the uses and needs that it satisfies and the wastes that it generates for the next generation.

Agriculture is a first choice for those who struggle to make ends meet. Commercial farmers are supported by a well-constructed technological, research and development system. In South Africa, each sizeable producer has to pay a levy (up to 5%) of revenue, to the National Agricultural Marketing Council that then uses this levy for research and development, marketing and transformation. This keeps the market intact,

and this is how the commercial system is upheld in South Africa. (Elsewhere, very similar systems hold sway.) For each crop, a well-defined production and marketing path is evident, and this is disseminated by production guidelines, often found on the label of the seeds, or in communications developed by various agricultural agencies. This moderates competition amongst producers (this keeps them all more or less the same) and moves it to competition amongst global competitors. As they all are organised the same, this has led to a competition between countries for the lucrative European, American and Asian markets. These markets cannot feed themselves (except arguably the American market), and the whole system in fact produces a high-quality food, upheld by the R&D – research and development - systems, and supplied by large aggregate production, and demand met by large-scale supermarkets. Food is becoming an elite affair….

These technologies of agricultural production are touted as scale-neutral, and the actual technology, the seed or the fertiliser, will certainly perform in a small-scale context, but the costs of these technologies are prohibitive, and favour those with large farms. For instance, it is not possible to make a "living" out of farming maize with less than, say, 400 hectares (ha) available. This is because of the costs associated, especially with fertiliser, and at this point, the "bulk discounts" on fertiliser for 400 ha or more, will enable a farmer to make some profit. These discounts are not available if you farm only 10 ha… However, there are very many farmers with more than 400 ha available to them, and, hence, the 10 ha farmer will struggle to compete with them. In South Africa we find about 400,000 farms, but we have less than 50,000 farming units that produce the bulk of our food. The South African food system is hostile to small-scale producers and attempting to find a niche for them, is a David against Goliath exercise.

It is this context that a new farmer will enter. We need to enable very many people to gain an economic livelihood, and very many people would choose to enter agriculture. How do we enter the food system with very little, as very many new and urban farmers will do? I prefer the world "emergent", as,

in systems theory it indicates that this actor will create new patterns as they enter the system. This creative opportunity is a sublime respite in this complex endeavour.

This book draws from the experience that I have gained in seeing many others work with small-scale gardeners. I have spent significant time with emergent farmers with more land than a "garden". Gardens, however, do hold some advantages over large lands.... What is important is that I have developed materials to introduce appropriate systems and technologies to them, and very many have struggled and experimented and developed novel systems themselves. I am borrowing and innovating on all that I see, and presenting this as a means, a manual or textbook, and guide for those who want to embark on this endeavour. I aim to clarify how such new entrants in a food system can get ahead.

The food system is responsible for at least 30% of all our emissions, impacts on biodiversity, water and land use. It will be difficult to pinpoint this impact, and the food system includes both agriculture and the ways that we transport, distribute, sell, and ultimately waste foods. It is in this conglomeration of activities where the trouble, and the solution lies.

Here, we will detail one possible but broad avenue of empowerment and development for emergent farmers. Emergent farmers are today not necessarily found in rural areas. In South Africa, there may be more than 2 million people with access to small parcels of land. Some say that there could be much more, as the former "homelands" still hold very many residents and all of them would have access to small parcels of land. There are about 300,000 small-scale farmers in South Africa who produce regularly for the market. Then there are urban farmers who succeed in producing food from smaller gardens in townships, and who may be buying from and selling produce derived from the existing and well-functioning fresh produce markets in South Africa. We will find similar farmers and opportunities the world over, particularly in smaller towns unreached by the global marketing system.

I believe it is possible to develop a viable and profitable enterprise at this point in the food system. The ways that we

will do this will determine and open up new possibilities for the future. We live in a world that has a clear tendency for uniform approaches and behaviours. However, this is our undoing, as we need to conserve and enhance the diversity of this world as we struggle to live sustainably.

When we examine the academic literature that has emerged around food system development, small-scale farmers are seen as either a new frontier for agricultural and food system development, or they are a necessary hindrance to the development of a fully commercial and large-scale "modern" food production system in the country. This is a wrong choice, and nowhere in the world is this solution evident. In fact, smaller farms produce more per unit of land than large farms. If we indeed approach this question scientifically, and with an economic logic that would want to spread the opportunity for production to as wide a group as possible, we will not focus only on large-scale conventional agriculture. We have the means with us to focus on diversity and the cultivation of food in niche areas. How we support this institution will determine how new patterns could emerge, and if we do so, we could engineer quite a cohesive and productive food-producing ecosystem in our midst. We create a system anyway with the way in which we distribute producer levies. If we turn our attention to urban and small-scale agriculture, we may have all the opportunity to "make it work". However, this will only take place if small-scale and new farmers take the lead, and pioneer the activities needed to build a cohesive system on a particular farm. Academic and other support has to focus on what can make such a farm work, considering what it is and what is possible. This book thus necessarily focuses on the emergent entrepreneur as an actor able to create new patterns of behaviour around the production and consumption of food. We, as academics and others, need to make available what can be achieved to do so profitably and with social and ecological benefit.

The neglect of small-scale food production will have equity and cultural effects. The development of commercial agriculture was a key instance in the large-scale modernisation of the world, which started even before colonialism and is not

yet at its end in the post-globalisation era. Food systems were and are the leading edge of the transformation of the world from traditional societies towards a modern and commercially based society. Often, where commercial agriculture was introduced, we did not follow-up with the roll-out of deep and truly democratic societies and political systems. Commercial agriculture, hence, had a role to play in a larger process of dispossession and ultimately urbanisation. It is here that we need to find a new solution for the food system.

However, modernity has not delivered its promises to the developing world, and we will see the emergence of a precariat in current societies made up of under-served urban dwellers who occupy mostly informal and less-than formal settlements. They do not benefit from widespread employment, and hence their interface and interaction with the food system (indeed with the whole of society) is in question. Food is expensive for them, and they would rely on diets high in starches and fats, sugars and meat, and very little vegetables and fruits. Hunger is a form of oppression but there is no clear oppressor, as the system that we inhabit is indeed the thing that is exploitative and oppressive. We all share this responsibility, and we uphold the system every day by our food choices. People are alienated from their foods and because we need food at least two times a day, this alienation has become pervasive.

Anyone can "make a profit" out of farming, provided that they know how to. Many are interested in poverty relief, sustainability, equity and justice. Attempting food gardens and smallholder agricultural development, with dubious abilities to satisfy food insecurity or livelihood objectives, is a highly peculiar, but is a revealing and interesting perspective on how we try to help others. In my work, I have witnessed not only food gardens but actors attempting to help these gardens by acting according to a certain script, or way of conducting "business", "farming", "self-sufficiency" (in all its forms) "food security" or "development". Often, this is led by narratives of "green development" and "food security". They often forget that it is income that leads to food security, and no one takes seriously the small-scale of these vegetable gardens. They often are too

small or lack intensive production systems to have any real effects. Sure, if we had 30% of urban lands occupied by small-scale gardens, the sheer volumes of gardens will make a decisive difference. However, we do not do so, and, hence, the farmer may produce a lot from a small scale, but the small-scale of the garden and the resulting pattern of behaviour around the garden does not support deep changes in society…

Here, we detail the things that a small-scale farmer can do to gain access to the market, be it through production, sales, or producing inputs and other products for the farm. To lower the chance of failure, would indeed take a bit more than is detailed here. Such small farmers may find a niche in selling at retail level, at producing a niche product, or in succeeding in converting waste to a product. The smallness of the enterprise does determine its fortunes only to some extent. Smallness can be re-negotiated by developing the means to produce higher-order products like liquid manures. It is through technology development and product design and sales – like liquid manures and small animals – that profitability can be gained. In dense urban areas, particularly those that are under-served by the state and market, the set of opportunities available point to a form of enterprise that is unlike the linear supermarket system that we are familiar with today. I believe that the reason that small-scale farmers fail is because we shoehorn them into a system that does not allocate benefits to them, and rather allocates these benefits to the logistics and retail participants. Farmers receive very little of the final price of food, and this can be overcome in a local enterprise development context.

Smaller urban and peri-urban farmers have a clear advantage from a certain perspective, and this book wants to exploit and enhance this advantage. Such small gardens need to realise the following:

- They are able to build brands, narratives and identities as farmers in dense urban and peri-urban areas. This will enable them to market a product by using the cultural cues available in every society. Farmers should realise that the retail form that would sell their produce in the best way, is still to be discovered. Farmers will discover this and if they

engage and interact with and experiment in society, the chances are good that they will arrive at a retail model that will benefit them.

- They should understand that there are biological technologies available to produce and sell in sufficient quantities, at low costs and with high profit margins.
- They should understand that it would be possible to "capture" the immediate market for vegetables in their immediate areas, and this will be the basis of their commercialisation.
- They should understand that if they are able to sell food at prices cheaper than the top-heavy retail systems, then they will decisively affect the health and human development of their communities. In fact, they will prepare the ground for much higher value consumption in the future. They can capture the market with this pricing strategy. This is how they could affect food security – not by local production, but by internalising local advantages, and using this to deliver goods at a lower price than the market average.
- Small-scale production can respond very well to enhancements in productivity. Biological systems can transform wastes to a point where significant benefit can be found. Here, food waste harvesting and compost production looms large. Hydroponics can produce a lot at low cost and small-scale, if we adapt these systems. Hence, the complex process of building enterprises, where different systems interact to ensure high production and returns, is possible.
- New information and communication technologies can give us a glue to bind all this together. Social media can be used to market, sell, disseminate, educate and organise a community, and this will form the basis not only of selling, but of building systems to harvest inputs from any community, and turn them into biological resources valuable for food production.
- Engagement methods, where you organise your community in a face-to-face way and on social media, to educate, market, disseminate and harvest inputs are available and can be used to build a viable small-scale enterprise.

This is a book about how to DIY a viable food enterprise. Much of the lessons contained here would be valuable to any new entrepreneur, particularly those who sell food, those who own a spaza or small-scale retail shop (I am thinking that they could be key partners with urban farmers), and those who have land but are being led astray by conflicting advice from state and other agencies. I hope that development agencies, both state and civil society, take heed and re-think how they conceptualise their efforts at "developing" small-scale farmers. I would like them to re-think and deconstruct their position in the global marketing system, and ask the question: "Is this appropriate?"

In these pages, I will make reference to important websites on urban agriculture, and devote a chapter on understanding the media on agriculture. More important than following these links, is the ability to search for yourself for information on the Web. The Web has made diversity in agriculture possible, and the provision of information and means to form relationships makes a lot more possible than before. One of the most important organisations that promotes urban agriculture is the US RUAF (Resource Centers for Urban Agriculture and Food Security) - see https://ruaf.org/. Another key resource is YouTube, and here, one can learn by viewing, and after a while it is easy to spot the most truthful information.

The South African food system is an exemplary product of the larger forces that has shaped the world food system. South African agriculture is highly advanced, one of the leading systems globally. Our public and private R&D system develops cutting edge cultivars, breeds specialised livestock, and we even make laboratory-grown meat. We sell this through sophisticated local supermarket systems, and a dynamic informal sector. We also export a lot, and of the highest quality. We work the land with the most advanced machines, and use the latest irrigation, pesticides and fertilisers.

This has ensured the food security of the country, even though almost half of South Africa experiences persistent but moderate hunger. However, it is not without its paradoxes. Our staple, maize, is grown by large agribusiness farms, often owned by Europeans (who often do not eat maize), whilst those who

do, only play a marginal (some would say alienated) role in its production. We have very many hungry people in the country. However, food security is determined by income and availability and access, not by volumes of food produced. Animals eat most of the food which we produce, and we could satisfy all hunger at the stroke of a pen at any time by re-allocating animal food to humans.... Why is it so hard to feed yourself?

The answer is circumstantial, seasons, water, soils, labour, and the fact that we eat through the market system. It is possible to feed yourself; it all depends on what resources you have. Why do smaller-scale farmers, or smaller enterprises for that matter, fail? Why can we not generate more livelihoods out of agriculture? Why can new kinds of farmers not feed the hungry? If commercial agriculture produces so much, why is there hunger? The answers lie in how the system allocates incentives and opportunities.

Some say this "green revolution" system is nearing its end. The up-front costs of these high-tech inputs, plus their detrimental impact on the climate, biodiversity and society (in health and unemployment and urbanisation) is now biting back. South African farmers are in debt, and dwindling in numbers, and we are seeing the classic symptoms of an extractive agricultural system: corporate concentration, biodiversity losses (in both wild and heirloom and other open-pollinated varieties of food), health impacts from the consumption of highly processed foods, and losses to livelihoods in rural areas, with consequent urban migration. Our supermarket system sits at the apex of these impacts, and hidden underneath it, sit many ills in society.

Urban agriculture may merely represent the tip of the iceberg of the needed solutions for our climate and food crises. We need to see food systems as regional creations and manage them as regional phenomena to achieve sustainability. We simply must move and transport less things on this earth. The inequities, economic inefficiencies and ecological impact of the South African food system can certainly be addressed, and many aim to do so, even with less than sincere intentions. However, to "empower" small-scale farmers, would need a very different

food system for them to deliver sustainable livelihoods. However, we are many people on this earth, and there is still the need for sufficient surplus production …

We never ask where our food comes from. Should we do so, we would do well to only buy those foods that benefit society in general. However, those who are marginalised and oppressed have to find or create the paths in this society that are conducive for their own improvement. All of us have to do this. It is this paradox – that the oppressed have to engineer their own liberation – that is the threshold if we want to eradicate poverty. We hold high hopes for the poor, forgetting that it is them who are the weakest, the most unable and the most oppressed that have to mobilise almost like a Nietzschean Superman to rise out of poverty. But this is how structural change has to happen. The problem is that we let the poor run a race that they have often run already and have already lost before. No wonder they fail often and repeatedly.

Structural change tells us that this race can be won by the poor should the race not be as rigged as it is, where the rich with means constantly compete against the poor with nothing. This highlights the intellectual inadequacy of defining the poor by their lack. We need to give them the things that they can use to build permanent protections for their gains. Can they construct "enterprises" out of nothing? What happens to them if they do things, can it "belong" to them? What do they use, indeed what do we all use to construct such enterprises? What is necessary is that the poor recognise their abilities – which is never zero. These abilities need to build new systems and systems need to span across society. Their experience of poverty – as an experience of marginalisation and exclusion; hence, it is unlike that which those in the centre experience – is the information that we need to make decisions on how to construct a new system. The system has to link all spheres in society. Hence, the way out is to forge new relationships between those who are unlike each other and would not have normally encountered each other in this highly stratified world. It is by breaking the previous system that a new one will emerge.

Reading the Book

This is a book for all urban farmers, and those who aim to help them. Urban planners may find these ideas amusing, but there are real indications out there that urban agriculture can shift our food systems for the better. To commence with this programme, we will navigate and set out the market opportunity for urban agriculture in the next chapter. This concludes on the four fields of action that need attention in developing an urban agricultural enterprise, and we set out the basics of a biological production regime, technology development, enterprise development and engagement systems. This is followed by a key chapter that details the techniques and technologies that you can use in your enterprise.

The next chapter talks about how you should design your products and services, and this is followed later by a chapter on how to make the most of your sales. There is a chapter on how to start, and how to mobilise the resources that you need to do so. The act of enterprise creation is not complete without a look at your compliance and the need to formalise the business, even if you plan on NOT doing so! We take a look at basic financial calculations, so that you know where you stand with profitability. We devote a chapter to technology and social media, and devote space to reading, learning and interpreting media for enterprise development.

Conclusion

I hope to, as I walked into a cooperative one day, visit a food garden in an urban settlement, that implements the ideas in this book. Such a garden will be well-planned and designed and will make the most of the sun to the north and the elevation of the landscape. It will store water at the highest point, in a reservoir and in the soil itself. This reservoir will be filled occasionally by manual means, as the garden uses minimal water. Soon, a solar- and wind-pump will help out. This water reservoir is connected to simple gravity-fed irrigation systems that the farmers have built, designed and maintained themself.

The design of the garden slows down the flow of water by contours and swales laid out over most of its surface. They

are planting water. I see a keyline, in addition to the swales, that brings water from the access road and surrounding houses to the garden. Right at the bottom of the site, I see a compost heap and liquid manure stations. I see several stations, and a compost extractor and aerator as well. There is a compost tea liquid manure station, a *Lactobacillus* reservoir, and stations for compost tea, brown liquid manure, and stations for nitrogen, calcium, potassium, phosphorous and sulphur-based liquid manures. All seem to be fermenting biological materials. Right next to this, stand several old bathtubs, full of earthworms.

I see deep trench and above-ground (or *Hügelkultur)* raised beds being constructed. I see heaps of material ready to use for this. There is a heap of animal bones discarded by a nearby butcher, a heap of sticks, from large to small, kraal manure, compost, grass clippings and leaves, all ready to be used in a deep trench bed. Next to this is a bag with charcoal dust or "biochar" for the soil. A deep trench bed is being constructed, and I can see the correct layers being laid, and enough mixing as well, in the bed. It looks like they are using biochar and kraal manure in the mix. I see a biochar kiln, a simple fireplace that is used as a kiln. The beds are clearly integrated with the overall layout and design of the farm, and I can see the tunnels, irrigation and cropping integrated with the bed design.

I see taller crops planted behind, at the south of the rows along the contours. In front of these are crops in descending

height so that all of them receive maximum sunshine. Crops are judiciously chosen with an evaluation system that identifies those most profitable. I see certain cops intercropped with others, so that we use their natural abilities to deter pests and so that plants that influence each other beneficially are planted next to each other. I see evidence of such companion planting and intercropping, the use of legumes, and the use of non-edibles such as marigolds to deter pests. I see some simple hydroponic systems – paint buckets filled with river sand from nearby that makes best use of the concrete slabs on the farm. I see tower, vertical and bag gardens, with compost and simple organic matter inside them. One of the grow towers or pyramids holds more than 50 plants and only covers 4 square metres!

I see a simple gravity-fed irrigation system for each row, and each bed is mulched and covered by small inexpensive tunnels. Everywhere, I see biomatter (old tree stumps) being used in the walkways, as low walls to arrest water, and being used as infrastructure. Every inch of soil is covered by a mulch or a plant, except, of course, in the chicken coop and the kraal for the cow.

I see a sizeable seedling nursery and more trays of seedlings than the garden needs. There is a queue of farmers waiting to buy seedlings. I see a greenhouse growing seeds for sprouts as animal feed. I see seedlings of various sizes and this indicates that there is a planning system for the planting. I see a big cupboard in the office, with several pots of seeds, and a file and documentation that looks like records of seeds loaned. The seed library has a list of names, and records of many seeds loaned and received. I notice a few reference books on agriculture and a Wi-Fi router.

In the office are table and chairs and record books of every sale made. Next to the office is a small shop selling vegetables, and a few other items. There is a laptop, and someone is using WhatsApp to send out price lists of specials this week. There is a neat file with record books and other company documents.

They have just finished hosting a community education session at the farm. Many of the regular customers and a few new ones were there. Many sales were made that day. Several

scholars from the school where the farm is situated are there and they participated in the community education sessions. They all have been trained in basic agriculture at the farm, and this has enabled the farmer to build a few of the deep trench beds. Seven-kilogram (kg) bags of potatoes were going at low price as a bakkie trader came with a full load. A nutrition education session was held, and this explained the benefits of fresh vegetables as part of the diet. Eggs from the chickens and milk from the cow at the bottom of the garden were sold. 10 live chickens and 2 rabbits were also sold.

The guests received a tour of the garden and the whole permaculture design and organic production was showcased. Food safety and nutrition were explained. This was linked to the garden, the soil and the way in which food is produced in the garden. The garden has a beautiful name and there is signage advertising prices and services at the garden.

Guests were shown the food-for-waste exchanges. There is a food-for-food waste, food-for-biowaste, and a food-for-recyclables system. The farmer will take human urine in closed old paint buckets. This is used in the liquid manure system and is mixed with manure to create a liquid manure that is sold to farmers and applied in the garden. They manufacture a liquid manure with the urine, kraal manure and compost extracts that they sell at high price in old soft drink bottles.

The farmers gives a few rand discount on any second-grade food that they sell, in exchange for recyclables or biowaste of various kinds. Most people can bring at least one old paint bucket of biowaste when they shop, and this is taken to the compost heaps, which are growing every day. Old cooking oil is taken in, as this has a high price, and a reclaimer uses this to make biodiesel on site. Recyclables command a similar discount, and this is sorted after receipt, and stashed away in the "wool sacks" common amongst reclaimers. A reclaimer is in a partnership with the farmer and collects the recyclables for cash once a week. At the farm is a seamstress and an appliance repairman, and they receive clothes or old appliances and fix these on site.

The shop of the farm is neat and tidy. Vegetables are harvested upon demand, and there is no need for cooling. The farmer prefers sales early in the morning and late in the evening so that they can focus on their production.

Prices are advertised as lower than supermarkets and this is borne out by the use of a scale. Customers know that this is a good deal. However, we all know that the bunches are larger… and the farmer often gives out second-grade food for free.

The shop sells first- or second-grade foods. Second-grade foods are exchanged for wastes and first-grades are still lower-priced than the supermarket. The farmers use the third-grade food for their chickens, rabbits and the cow, but they feed them with a sprouting system where they sprout seeds for animal feed. That is why the milk and eggs taste so good. They also sell consumer items, and this contributes to revenue.

The shop sells spinach, kale and most other kitchen vegetables. Specials and bulk-selling is regularly conducted with staples. The farmer is in a partnership not only with a bakkie trader for potatoes but also with a large commercial farmer and sources maize meal from him. That is why it is so cheap.

I reflect on what I see, and realise the enterprise development and food system innovation that these gardens hold. How could I describe this offering to entrepreneurs, who are mostly new entrants to the practice of enterprise development? It is necessary to approach this as a formal educational and business development opportunity. This commences with the articulation of the unique value proposition contained in this elaborate and romantic vision above. The unique value proposition for urban agriculture, as described and developed in this book, is:

> The creation of a price reduction mechanism for urban agricultural produce through the local recycling and repurposing of waste.

In the pages that follow, we will re-articulate and build on this core proposition for urban agriculture, as practiced in the Global South and in developing contexts, can offer to the world.

Chapter Two

The market opportunity for urban agriculture

According to Statistics South Africa (StatsSA), in their *2022 Agricultural Census Report,* at least 2.1 million households produce for sale and own consumption in their backyards. Many believe that there are about 300,000 small-scale producers in South Africa who regularly produce for the market. In addition to these rural producers, between 10% and 70% of urban residents may be engaged in urban agriculture globally. There may also be significant numbers of commercial producers located adjacent to informal or formal urban areas. Further afield, in the developing world, we find many, if not the majority, dependent on retail shops and the informal sector and local agriculture for their food purchases. Often, urban residents find themselves in new settlements, under-served by both the market and the country. Up to 70% of such urban citizens may be engaged in urban agriculture, depending how you define it. Many of these producers cannot afford the expensive inputs of conventional agriculture, and if they had to, would probably not be farming at all. Those who sell commercially, struggle to make ends meet in formal marketing chains and receive very low prices compared to what customers are paying.

The very large constituency of African and developing world farmers at the end of the food production spectrum need the right kind of support, and this should be appropriate to them as smaller producers. Appropriate support will identify commercial opportunities peculiar to their contexts and then work out – backwards – how to satisfy them. A new approach to enterprise development is called for that does not presuppose that such farmers will graduate to rural commercial producers and will supply formal retail outlets through the modern

marketing system. This support should not necessarily aim immediately for commercial entry, and we should note that "commercial" agriculture has many meanings. We focus here on the circularity and regenerative character of the urban farming enterprise, which holds competitive advantages and can secure the functioning of the enterprise. We should note that, if a small enterprise can be made profitable, we will see many more farmers becoming "commercial" producers, particularly on a small scale. This needs a model of what a commercially viable enterprise could be.

In this chapter, the market opportunity for urban agriculture is navigated. Urban farmers focus on feeding themselves and their immediate communities, and there is a real commercial opportunity here. The costs associated with conventional agricultural inputs and competition with concentrated processors and retail conglomerates in the food system affect the developmental prospects of such small and urban farmers. The environmental impact and financial costs of conventional agriculture would immediately affect the productive potential of these urban farmers, as they simply have to rely on ecological means over the long run to guarantee fertility. Any

developmental programme for this constituency needs to enhance the ecosystem services that they depend upon. At this end of the spectrum, we have to find a way for them to gain a greater share of the retail price of food, as a small enterprise in this market faces significant competition. This chapter is about the niche in this market that would make this endeavour worthwhile.

The programme envisaged in this book aims to build the ecosystem services that secure the productive potential of urban farmers. This links the production of food with its sale, and in turn, a food and biological waste harvesting system. This would increase volumes and profitability enough to consistently serve and secure immediate markets. However, urban agriculture may only be able to produce low volumes of food, and, hence, we need to develop a production system that thrives on low-cost inputs and high-value sales, and we have to invest in secondary processing of some things, and in technology use, to make the enterprise worthwhile. This agro-ecological knowledge – knowledge on how the process on a farm creates an ecological system – will also benefit other rural producers who start the journey to sustainable practices.

In this book, we set out a programme of enterprise development for nascent, emerging, small, and regenerative farms for the more than 2,5 million farming "units" at this end of the food production spectrum in South Africa. There are many farmers elsewhere in the world who serve markets that are both deeply and badly integrated into the global food marketing system. These farmers have a competitive advantage, sketched in this book, over supermarkets, and that is the base of the programme developed here.

Urban farmers are primarily **creating new kinds of urban food markets**. **We create markets by how we design and then create products and services for it.** Currently, urban food production is unusual, and we need to redesign consumer behaviour, so that they support urban agriculture. In this book, you will find concrete suggestions, and some new ones, tried out by urban farmers already. These constitute a comprehensive system of food production, retail and waste management and

these are designed to enable an urban farmer to create and build value amongst their customers. These include suggestions on how to stack technologies on top of each other for high-value intensive food production, how to link the enterprise with these production systems, and how to harvest waste and integrate this with the enterprise. This includes engagement methods, and these are designed so that you can mobilise the community to support your enterprise, and how to maintain these networks for food production.

An entrepreneur should be able to read the market for opportunities and risks. Once an enterprise is established, a long process of experimentation and change to the products and services on offer must follow, as markets, circumstances and products change. Enterprises always change. Without the initial spark of creativity in setting up an enterprise, the further spark of continuous innovation will not lead to a fire. These sparks emerge when we engage in a market analysis to identify opportunities. They also emerge when we acquire a new skill, knowledge or technology, and enterprises are the home where these are exploited to gain income.

An opportunity is created by the way in which you look at the world, and this depends on the means at your disposal. Product and service design should meet this opportunity. I could be offering a complete solution here, or I could enable my readers to develop a solution for themselves. Note that true empowerment will only occur if people can develop new enterprises on their own and by their own means. An entire sector will be strengthened if each individual player operates effectively. Usually, ready-made opportunities are presented to new farmers, enrolling them into projects of entire industries. Urban agriculture is a new industry with undefined markets, customers, products and services, and, hence, a new approach is needed. Below is a way for such entrepreneurs to develop their enterprises.

The urban agriculture vision: Informing the market analysis and enterprise creation

The intentions of this market analysis are to enable an entrepreneur to identify lucrative opportunities and critical inefficiencies in the current structure of the food market, and to respond to these with novel solutions. In most cases, we will be selling food, but it is how it is packaged as a product or service, and the features of it, that makes the sale. The last chapter ended with a description of how such an urban agricultural enterprise could function in society. This rough material is up for grabs. We now have to "reverse engineer" our enterprise vision to create new solutions to the critical inefficiencies in the food system.

The unique value proposition (UVP) of urban agriculture goes beyond the mere provisioning of food and affects all aspects of the enterprise. We articulate this UVP in such a way that it would structure our thoughts and actions in developing this enterprise.

The creation of a price-reduction mechanism for urban agricultural produce through the local recycling and repurposing of waste triggers a circular enterprise form, in that the wastes and by-products of systems, processes, plants, animals and humans in this enterprise, create opportunities for subsequent systems, processes, plants, animals and humans. This regenerates the resources that the enterprise needs to function. This enterprise form and the way that it interfaces with society creates new opportunities, and this chapter will identify these.

In conducting this analysis, we will identify strengths and weaknesses in this enterprise model. However, the model flows along the lines of the vision set out in the last part of the previous chapter. This vision should guide you in making adjustments and developing your enterprise, but keep an eye out for new opportunities not spotted in this book.

The urban food system

Townships and under-served settlements export value away from local areas, as people often shop outside the township or in malls with globalised supply chains, and often work outside the immediate area. Life is made difficult by public health impacts like dumping and a neglect of waste removal, and all of this has negative impacts on new enterprises. The "market failure" that we witness in townships (particularly in secondary and smaller towns in developing countries) must be addressed by enterprise development models and pathways that will create and accumulate value in local contexts. It is this value that needs to be "translated" to better incomes, higher value products and more secure livelihoods for entrepreneurs and their customers in the townships.

Building local economies in new settlements should revolve around the capture and accumulation of value in local contexts. Urban farmers are primary producers of value, and we

need a systematic means by which this value can be translated to value for the farmer, customers and society. Customers produce unrealised value in the waste that they generate and the social patterns that they uphold.

At the level of new, emerging, and "informal" enterprise, we should see sustainability as a competitive advantage in establishing a new venture, and this suggests a new business model for under-served economies. In a sense, the dearth of waste removal in townships, the lack of proper planning and existence of open space, and the (high) supermarket prices of food, create economic opportunities. A programme of sustainable development for emerging enterprises would have to exploit these gaps in our society, and in a sense, fill them with enterprises that deliver net positive value. The value that is lost in these gaps in the system, is the value that needs to be translated to a viable sustainable business. It is these circular processes that give advantage: they substitute for buying expensive chemical inputs, they substitute for marketing and branding, and they build constituencies of customers that ensure the longevity of the enterprise.

A method of analysis should enable any entrepreneur to understand the markets that they are aiming to create and develop. Opportunities for urban agriculture are created by the place of urban agriculture in the global and domestic economy, and its relation to conventional agriculture. We will find opportunities in the inefficiencies of supermarkets, and we will react to these with innovative alternatives. We begin this analysis by looking at the customer of urban agriculture, and this itself reveals several opportunities.

We analyse the key features of urban agriculture, to see how these features can translate to product and service design. The exact way in which we design our products and services will determine what the markets look like in which they will feature. In all these cases, the "market" is not REALLY there, but only comes about when we introduce the product and service to society. The design of the product or service thus creates the market (which exists only at the moment that the product or service is available).

Any entrepreneur should be able to analyse any possible market and develop a product or service appropriate to it, as this will occur throughout the life of the enterprise. To do this, you have to understand how markets work (and I "deconstruct" supermarkets to show how), and these markets do not "work" simply by setting prices and exchanging goods. Markets work because behind a product or service is a pyramid of supply, and here, we can see how the whole industry behind a market "works": the food industry works by using current technology, availability of finance and materials, and current patterns of behaviour. Urban farmers, seeing that they are creating new markets, need to understand how they can assert themselves as rightful entrepreneurs who can structure these patterns of society.

Below, I emphasise injustices and disadvantages in such a way that we can overcome them. We need a critical but opportunistic analysis, if we want to identify real opportunities for growth in urban agriculture. We conclude by looking at how we should think about sustainability to make it work for these enterprises, as sustainability gives a reason to imagine new possibilities for enterprise development.

Township and new small food businesses and urban agriculture in the South African and global economy

Small-scale farmers constitute the majority of farmers in the real world. To build viable enterprises where small farming and urbanisation meet, the terms of engagement with the producer, from production to retail, needs to change. Townships, and outside South Africa, urban areas in fast growing towns have been marginalised, but the apartheid and global marginalisation of such settlements has created fertile ground for the localisation of our current "informal" food and economic systems.

We will find, particularly in developing countries, urban areas under-served by global food marketing chains, and a dearth of formal fresh food retailers. Waste management may be insufficient, and we can expect significant quantities of waste being generated in such areas or settlements, and only an emerging and partial supermarket system. This is a very

significant opportunity, as there are many dysfunctions in this system, and many urban farmers worldwide will see similarities in the market analysis that follows.

Food marketing globally and domestically

The global food marketing system has its roots in colonialism, but these days, it really is a system of food trade that can guarantee the seamless movement of food across borders. The fresh produce markets are at the heart of this system and are effective at trading large quantities of food from large producers or aggregators like marketers, across borders. Supermarkets piggy-back on this system and are able to source in large quantities from fresh produce markets, or directly from farmers. They can handle the bulk although relatively small quantities can be bought from the floor of fresh produce markets (one layer of a pallet – about eight bags of potatoes, and note this for your own bulk-selling specials that are discussed below).

However, this affects prices, and in ensuring global food security, volumes matter.

Supermarket prices: a deconstruction

Fresh produce markets and their prices condition the way that the supermarket and the systems that support it is designed. Competition amongst producers contributes to structuring this system, but there are important critical insights here that every entrepreneur needs to understand.

When all players in a market sector use the same technology, the same buildings and infrastructure, the same labour and they buy from a common pool of input suppliers (farmers in the case of the food system who all operate in the same way), then their own enterprises and their costs and benefits that they are able to receive, start to become the same. An equilibrium is reached that makes it hard for players to differentiate themselves, except on size. Size matters and that is why both supermarkets and farms have historically tended to grow to the large mega-sizes that we see today.

Supermarkets differentiate themselves from each other, and market size starts to matter. However, there is a lot that is the same in all supermarkets, and this makes it hard for any one of them to offer a price better than the others. The competition and contestation amongst them, and the features of the supply chain, enable them now and again to buy lower than others, and these are the "specials" or reduced prices that a supermarket will claim to offer. The reality is that these things change every time they buy, and no one can control or predict this. Over time, prices, products, services and supermarket identities become almost the same, and deeper processes like fuel prices or global crises, really determine what prices they can offer. An urban farmer with a locally based enterprise, can avoid many of these costs.

Prices reflect the background systems of the supermarket. These systems stretch from the farmer and the farmgate point of sale, to the fresh produce market, and the logistics and distribution systems of the supermarket. The farmer pays for transport to the market, the agents' fees and the fee to the

municipality. The supermarkets buy the food, but the farmer has to pay for the transport, storage, waste, agents and municipal fees and these do influence prices. These costs are absorbed by farmers worldwide. Urban farmers can immediately save these costs, and urban farmers need to know how their rural counterparts operate and beat them at this point in the system.

The supermarket can only buy in bulk from the market (or the farmer directly) and this bulk purchase carries costs of transport, storage and cooling, and immediate processing and packaging because of the bulk nature of their purchases. These activities cannot easily be carried out at a single supermarket, necessitating a logistics system; another cost. Urban farmers need to note this. From the processing and distribution hub, food is taken to individual supermarkets. There may be more than one logistics stop in this chain, and often packaged foods are transported in bulk over long distances and distributed to more than one point.

These distribution systems are a risk for supermarkets, and this creates a niche for urban farmers. These have impacts, on prices and on emissions and sustainability, and urban farmers can emphasise the local nature of their produce as an alternative. Below, we speak of a bulk-selling retail strategy, and this is a response to supermarket challenges with logistics. You, as an urban farmer, can innovate above this supply chain of supermarkets by the way in which you further develop your products and services. You may be selling the same potatoes, but the way they are sold, and the price accompanying them, is the key way that your product design can attract customers. This develops the enterprise, in systems and processes, and brings revenue and builds clients. It makes the enterprise stronger, and with that, its ability to withstand shocks and consistently deliver benefits.

The focus on volumes in supermarket value chains is the first inefficiency that urban agriculture can exploit. These volumes necessitate transport, storage and processing, like packaging. These costs add up but are brought forwards to the consumer. Included here are the costs of advertising, branding and sales. As you can see, supermarkets expend more money

on fresh produce than they can bring in at most times. Most of them make almost no profit on their fresh produce sales and use it as a means to sell more expensive manufactured products.

The urban farmer can offer a much more compelling value proposition. The produce itself will not only be fresher, but access is much more convenient. The produce also incurs lower costs to society, as there are no transport costs or emissions, and the food may be produced in environmentally friendly ways. The differentiation of urban agricultural produce from mainstream produce is a key issue in its marketing, and below, we aim to exploit this fully!

Only with these critical insights would an urban farmer be able to offer different products and services, and in this way, gain access to the market. These products and services will be the same vegetables, but the way in which they are marketed, produced and presented to the public is different, and this is where the niche market for urban agriculture emerges.

The customer of urban agriculture

Urban agriculture takes place mostly amongst the poor. Their customers are most often food-insecure, and all are searching for good value in food markets. They will be served by underdeveloped food systems and often have to travel long distances to the nearest markets or supermarkets. They are not

served by waste management systems and would receive only fragmented urban services.

These customers are poor, but they can be expected to shop much more discerningly than richer customers. They will be most responsive to low prices and will be open to good deals. These customers are often not included in advertising and marketing messages, as these aim at middle-class and modern consumers. These clients are likely to be open to the cultivation of indigenous crops and foods, and their consumer habits are a blend of Western and traditional habits. They will shop at both formal retail outlets and also from informal sellers and will be open to a blended approach to food provisioning.

These customers reside near or next to the farm, and they will appreciate convenience and low prices. They would be familiar with both the supermarkets and the informal sector and are open to experimenting with new ways of consuming foods.

These customers experience a lack of education and information and may have free time on their hands. They can be trained in agriculture by local farmers, and this can expand the labour pool for urban agriculture and bring more producers into the mix. They will be open to training, open to buying seedlings and inputs, and can offer labour for training in lieu of being able to pay cash for this.

In South Africa the "food poverty line" is defined as R760 per month (in 2023). There are other metrics that also measure it, but this indicates how much money anyone would need to spend on food purchases. As an urban farm would mainly focus on kitchen vegetables, we can assume that up to 40% of this food basket, R304, is available per person per month. Should you be serving 1,000 consumers in your immediate vicinity, you are looking at R304,000.00 as your maximum turnover. Realistically, you would have to create a shop or market for fresh vegetables in your area, and how people will spend here is up to you to determine. Now you can start to calculate how many people you could supply from your farm, and now you can start to see how many consumers you can serve and what the maximum income could be. Now you have a horizon of income

that you can start planning for. Now you can see what customer base you could potentially supply!

It is important to understand how your customers will interact with you, and how many you could serve. Now you can start to understand how competition works, and where they are. Identify the competitors, supermarkets and informal trade, and you will start seeing where the customers and competition are. Note the prices paid to these traders and set your own prices accordingly.

These customers are a resource that can be used in the engagement systems detailed below. The ways in which they are integrated into the farm will decisively affect its profitability. These customers are a source of waste, a source of labour and can act as ambassadors for the farm. They will also buy seedlings, compost and liquid manure from you.

Customers in developing contexts will be open to enterprises that place their interests at heart. In South Africa, the "township" economy is determined by local considerations and interests. People prefer to shop locally and have local benefits in mind when they do. People will be able to "make" the world that they live in if the message from retail is conducive to this. An urban farmer can emphasise the beneficial effects of urban farming to their customers, and they will likely support this branding approach!

Customers are at the apex of the social systems that you need to engage with in order to create your urban farm. These customers exhibit behaviour that is conditioned and determined by the social systems that surround them. Their buying behaviour, and the benefits that they gain from it, is structured by the formal commercial systems around them. If you can influence their buying behaviour, you can influence how society perceives and supports your farm. We now turn to analyse these, and here the benefits of urban agriculture vividly come to light.

Analysing the enterprise opportunity for urban agriculture

Low volume, high returns

An urban agricultural enterprise, indeed, any small farm, is only able to produce in low volumes relative to its large competitors. **It produces in low volumes and, hence, must sell at the highest retail price to make the enterprise worthwhile.** This means two things: the quality of the produce and the prices obtained must be as high as possible. **Production costs need to be super low or if possible, almost eliminated or substituted with things like biological processes, labour, design, technology or social engagement. A 'zero budget' approach to inputs needs to be cultivated.**

This, alternatively, means that the highest possible competitive retail price must be obtained for all produce and services. This is why urban farmers must establish a food retail enterprise at or near their farm, or with someone else. This enables the elimination of middlemen in the value chain. This also means that a strategic pricing innovation mechanism must be established to achieve a high retail price.

Low input costs

Producing low volumes in comparison to large-scale farmers (but as high as possible per square metre), necessitates a low capital-cost input regime. **Inputs must be sourced as cheap or as free as possible and this points to a waste harvesting system, and a biological production regime.** Inputs should thus be sought either for free or in exchange, so that value is created and conserved in this transaction. **You need to harvest wastes and re-purpose them as inputs to the farming regime.** This is how you can avoid input costs, and this necessitates a system to harvest and process wastes.

This means that all production must be highly intensive. To achieve this, a grand approach to **the design of the farm**, from layout, to energy, water and all other systems, is required, and this must integrate production with harvesting, with technology and community engagement. **Permaculture design** and other

methodologies need to be used, as these maximise productivity and create *Nxazonke* or links between systems. Waste from one cycle needs to feed the next cycle.

This necessitates great innovation in biological technologies, and others. Biological technologies are discussed in a separate chapter, but what is important here is to **combine as many systems and cycles as possible**. Exchanging and integrating waste from one cycle or *Nxazonke* with another, increases its value, and the movement of materials, goods, technologies and people from one *Nxazonke* to another is what builds value in these enterprises. This creates **multiple products and services**, and this is the key to understanding profitability, robustness, and sustainability of the farm. This gives the best guarantee to create a long-term viable livelihood, as value is created in each cycle and an urban farmer will design a series of interlocking ecological systems that will combine production and retail on their farm.

The profitability profile of an urban agricultural enterprise

It should be clear that underneath the urban agriculture business model is a **profit profile initiated by low input costs and completed by high value retail sales**. Most businesses do this differently, and linearly, often with overall input costs and overheads close to or beyond 50% of the turnover of the company. They then manufacture, add value or services to the inputs and after all wages, taxes etc. are paid, most companies will be happy with a 3% profit margin (as their competitors). Anything else above this is a bonus.

An urban agricultural enterprise will have a very high profit margin – but from an extremely low base. This can only be achieved by harvesting biological wastes from urban areas (even harvesting sewage and human excrement one day) and manufacturing high value inputs (possible through biological and simple manufacturing) on their own, using this in a biological production process, and ultimately selling at retail level.

Biological technologies, together with robust intermediate technologies – good composting systems – can contribute to the above. However, the way that the enterprise should be managed, should be to always lower these input costs, maximise the value of the inputs, and then apply them for maximum productivity, as high retail prices are received for produce. This is the attitude and orientation that the urban agricultural entrepreneur should take. This will force the entrepreneur to obtain the best possible information on liquid manures, production techniques and tools, retail opportunities and utilising the community in a beneficial relationship to build this farm. Here is where the most important innovation is called for.

Product and service design

The key differentiating factor for the kind of produce that an urban farmer sells is **price**. We know that it may all be the same potatoes, but the price, where they are sold, what is sold, and the way that things are produced have deeper effects on society. This needs to be emphasised by urban farmers. **They**

can sell and market at a lower cost than nearest competitors like supermarkets. This will enable them to capture the immediate market for vegetables. Note that supermarkets are burdened with high costs in selling vegetables. Customers for urban agriculture do not often include millionaires and customers will likely hunt for the best price. **Establishing a price as lower than supermarkets will, over time, attract customers to the urban farm, and the urban farm will start to influence the whole market.** These prices need to be advertised, and this is necessary and will create a professional reputation.

Because urban agriculture produce is produced with wastes, it is likely to have effects on the beauty of the **landscape**. Because wastes are harvested, the entire area will be improved over time. Urban farmers need to be mindful and aware of these things, as ultimately, they could engage with the state and waste planning. You need to find a way to engage with landscape services, – parks and recreation – and get them to deliver biowaste to the farm.

Over time, people will be buying food at lower than market prices, which will enable their own human development to improve (hopefully at better than "market" rates). Over time, the community health will improve, nutrition will drive this, and this is driven by lower prices. **These are real effects, and the urban farmer needs to be aware of this, as this has marketing value.** These effects need to be noted and operationalised as advertising messages in community events that will market and brand the urban farm.

Production opportunities

By innovating in waste harvesting and waste processing techniques and technologies, an urban farm can secure its position in urban metabolism and life. In a separate chapter, a series of technologies are presented and the sequencing and integration of these will enable production at very low capital cost. **This low capital cost of production will enhance the ultimate value that we will derive from urban farming.** To do this, a farmer needs to be innovative and build and sequence a

series of technologies for food production. The more interlinked *Nxazonke* or cycles are created, the better.

These production opportunities – say, harvesting food waste, feeding it to chickens, feeding the chicken manure to worms, and then feeding the worm castings to the soil, is the kind of system that we need to build. Enhancing this simple cycle with additional biological processes, community engagement, awareness and participation, will create the systems that are needed. For instance, and this reveals the way this book works, **if the community is aware that their waste harvesting lowers the prices of their own foods, then they will likely support the urban farm**. If they are aware of the benefits of fresh foods on nutrition, they are likely to support an urban agricultural enterprise. An urban farm, being small, can directly engage with customers (and note that because of the small nature of the farm, these customers will rarely exceed 1,000). In direct engagement, information about production and ecology can be linked to prices and community benefits. These things can be communicated in events at the farm, and this is a key way that an urban farm can build itself and recruit customers.

Own produce and bought produce

Any food retailer has to source from more than one point in order to supply their market consistently. However, a product manufactured or produced, value added, and then sold, invokes a different supply and value chain, and its profit profile is a lot different than in a linear setup where goods are bought in bulk and then sold indivudually. An urban farmer can receive a very high profit from own produce, but this creates **an opportunity to sell own produce alongside wholesale bought produce**. This may enable increased sales of both, as the one, wholesale bought produce, could include staples which an urban farmer is often unable to produce. Hence, **combining these two different products, and differentiating them as complementary**, is key. People will often use more expensive vegetables to make a relish to be eaten with staples. Think of *Morog* with pap, or *Nsima* from Zambia. This kind of combination, and its marketing, could be an important niche product and service for an urban farmer.

Retail development and ancillary enterprises

Small urban farms that produce low volumes of high-quality produce have to have a high profitability profile to survive. This can be achieved by building a retail enterprise at the farm. Another way to survive would be to develop several additional enterprises on the urban farm, and multiply revenue streams, and allow cross-fertilisation between these enterprises.

An urban farmer should consider engaging with **reclaimers** and set up a recyclables-for-food exchange. By merely sorting these recyclables alongside biological waste on the farm, creates value. The harvesting of waste will integrate price reductions and other effects, from nutrition and human development to landscape effects and it will raise capital. The deeper effects relate to social justice and economic inclusion. By enabling consumers to influence prices we make their behaviour economically important and productive. In Chapter Four, we detail the design of waste harvesting technologies. These are discussed as a means to create and sustain the enterprise and should be seen as part of enterprise operations.

Showcasing your production system to your customers will illustrate its benefits, and if integrated with waste harvesting, you will show how they will be able to lower prices of your produce. This will illustrate the whole production system to customers and with this, you can influence customer behaviour. Emphasise in this regard the long-term effects that this will have on nutrition, waste management and landscape. The farm is at the heart of community-well-being and this is a key market opportunity. This will be relevant later on when you develop engagement systems and the engagement systems in fact show these benefits directly to customers.

This illustrates how products and markets are created. In all cases, we see an interaction between actors like farmers, retailers and customers. This interaction, over time, creates the market and the products and services available.

Limits to small farms and urban agriculture

Small farms in urban areas are only able to produce low volumes of high-value crops, and this is a severe limitation, but this can be turned around to a profitable proposition. However, in advocating for small farms, we need to keep in mind their limitations. These include the following:

Food security cannot be guaranteed by a small farm, as the volumes of food produced may be too small. However, food security is determined by income, and not availability of food, and a farmer needs to know that it is the reduction in prices that holds the most benefit for the community. Making food available "for free" will, in the long run, damage the ability of the farm to supply food at low prices over time.

Benefits to the community lie in labour and education, in addition to lower prices. Labour may be unaffordable, as workers with agro-ecological knowledge are scarce. Start to develop labour and integrate this with production. If your workers understand the biological production process, and if they are able to use technology in their work, you will create value by using them. Hence, you need to focus on using skilled workers, and you can train them in these skills. In almost all cases, workers must use technology so that returns on labour is

higher than you pay in wages. You should also develop ways to integrate state-sponsored public works programme beneficiaries into your garden and offer them training and experience. This is better than "free food" and rather offer food (that you produce yourself) to those who come to work and learn.

The farm can supply a livelihood to only a few people. That is why regular labour needs to be productive, knowledgeable and skilled, and all other labour needs to be organised as training. Find good workers and pay them almost as much as yourself. Make sure that they know this. Note your earlier analysis of the value of the urban food market. Keep your labour costs reasonable regarding how many customers you can serve. Note that the best way to maximise labour and all other productivity is to invest in the soil and to invest in technology. The more productive the soil, the better the returns on everything. Investing in deep trench beds multiplies the value of labour. The beds are a form of technology and maximise the multiplier effect of technology by using multiple technologies together and in sequence.

Be aware of the need to keep good records. You need to know everything about your farm to make the right strategic decisions. Often, profitability is lost in sloppy record-keeping, but you need to be aware of what makes money and what does not. A planning and evaluation system for your produce is key, and this can be developed by looking at your records. You would be able to easily see how much people buy from you, when and what. You would also be able to see if your prices are too low, as this will attract more people buying larger quantities that they then sell on themselves. Start a loyalty programme for these customers, instead of limiting their quantities. Stable income may be better than spikes of high sales…

Be aware and mindful of "informal" arrangements regarding access to land and to other spaces. Urban farmers will only be able to afford land if agriculture is planned for in our cities. Market prices for land prohibit urban agriculture. A lease is often the only way to gain access to land. It is better to formalise access to land through formal leases but pay back in kind (in food) and not in cash. Land prices would be

unaffordable if you cannot make an arrangement with the right owner. That is why much urban agriculture takes place at schools, as benefits in kind are valued. You need security of tenure, as you will be making big investments on your land if you follow the advice given here. You need to think of your farm as a real business that needs to be run like a business. Let your business trade in "value"!

Urbanisation is taking place and is a driver of supermarket expansion. However, urban development projects cannot keep pace with urbanisation, and many people arrive in urban areas from rural areas, and many try to recreate their rural and traditional lives in urban areas. These kinds of customers will be more familiar with local food production than others who have resided in urban areas for a long time. They will be responsive to the kinds of products and services that you can create, and serving these customers is a real opportunity. Those who have spent longer times in urban areas can also be attracted to your urban farm by messages of sustainability, community health and local production. Engagement methods can mobilise both these constituencies as customers of your urban farm.

Below, you will find sufficient material to engage on an enterprise development journey. In the next chapter, we look at the basic technologies and means that you can use to build this enterprise. After that, we detail the ways in which you can build your business further, and this includes reference to prices, systems and technology, amongst others. We conclude below by contemplating how we should be thinking about sustainability in this context.

Sustainability

Sustainability needs to become a means to enable marginalised entrepreneurs to gain a foothold in the economy and should be the basic means by which we develop a new enterprise. Sustainability is not a way to ensure that developed nations' interests are protected in global development. There are many ways in which we can use the word "sustainability" and here, it is employed to chart a path to enterprise development that can give durable benefits over the long run. Sustainability is

integrated and conditions the unique value proposition for urban agriculture in this book:

> The creation of a price reduction mechanism for urban agricultural produce through the local recycling and repurposing of waste.

At the heart of this UVP lies the waste exchange-for-food facility. These circular relationships between the farmer and the customer are how sustainability is achieved. Eliminating waste and packaging, food miles and producing locally contribute to this, and these avoid emissions and impacts. This circular relationship, in fact, operationalises a waste transformation system that reduces dependence on resources and transforms resources so that they can be used again, realising future generations' interests. This is a very real and substantive sense that creates a sustainability mechanism in the urban enterprise.

This is important, as urban agriculture will attract attention, and we will not be able to complete a comprehensive programme of urban agricultural development without being able to vouch for its sustainability. In a sense, there is a political opportunity for urban farmers. The resource conservation of transforming waste into productive inputs not only delivers good food but affects the wate management costs of any city. Illustrating that an urban farm can process and transform waste enables others like politicians to insert urban agriculture in the planning agenda. These wastes are not discarded but they play a role in production and the creation of wealth. By turning wastes into value, significant impacts on society can be expected, and this also concerns poverty relief and job creation.

Achieving a true sustainability will enable politicians to take up the cause of urban farming and campaign for it. For them to do so, they would need strong support and evidence from the ground up. There is a real opportunity here to make known such a way to produce food and emphasise the effects and impacts of this way of producing food.

Producing food at lower than market cost (through price-setting mechanisms and by giving discount on waste exchanges) enables poor consumers to eat more and better, and over the long term, may affect the overall health of communities. Food security is mostly affected by food prices and food prices and access to food is the key driver of food security, and not the overall amount of food that is available.

Lowering prices thus have the most immediate effect and impact on food security. Urban farms on their own are small and the food security impacts may be small and only immediate, but together, all urban farms, provided they adopt some of the suggestions here, are able to make an impact on food insecurity.

An urban farm will also create job opportunities, and create opportunities for new enterprises, like waste reclaiming, and appliance repairs. The overall socio-economic impact will be positive. Under-served settlements and townships do not enjoy access to the global economy and opportunities. Enabling production, in this case with low input costs and by metabolising waste, is a way to enable economic participation and the creation of wealth. Because the programme detailed here is focused on almost cost-less ways of producing, it has major social justice benefits, albeit by the poor for the poor. The transformation of waste is another. Below, we will detail extensive engagement methods and note that this is also a way of governing food production and societies. The programme detailed here is consistent with a radical agenda to transform society and agriculture to a more sustainable system.

Entering the food system: What you need to know!

To be or to become a farmer is not a decision for many; it is a calling. Many of us are really suited to agriculture. However, do not let this calling be your downfall: many have misjudged what is required to become a farmer. To realise this dream is like building an aeroplane while you are already in the air. Make the best decisions that you can. The kind of farmer that you could become would depend on the ideas that you have, the financial and other resources available, the land that you could get hold of, and many other things like market conditions etc. These decisions influence each other all the time and it is a shifting target. Be prepared for flexible thinking.

You have to take responsibility for everything, and you need to be strong to do so. You need to build an organisation – your enterprise – that creates a net-positive benefit, and the key choices which you have, revolve round how to maximise this net-positive benefit.

The recommendations detailed in this book revolve around four themes. These are grouped together into four fields of action that together constitute a comprehensive business plan and programme for enterprise development, and a way to think about the kinds of enterprises presented here. Together, these offer a viable way for urban farmers to get ahead and build viable businesses that can deliver a livelihood for the farmer and their workers. These operationalise the best practices for circular and regenerative enterprise development.

Biological production

In the next chapter, I detail several technologies and production means that can enable a small farmer to produce with low input costs. These start with composting, but composting, for instance, includes several different technologies, including compost teas, extracts and specialist liquid manure technologies. It leads to mulching, to small-scale irrigation, to tunnels and other technologies. Seeds, and planting, and integration with animals, amongst others, are also mentioned. These can be integrated into cycles of production where the waste from one feed the next. It also integrates with a food-for-waste exchange,

and these create the production sub-system of the enterprise. Farmers need to build such systems with the elements listed in the next chapter. This needs technology development, but also enterprise systems, and community engagement. In Chapter Four, I detail how to put this all together…

Technology

Much of the technology that would be needed to establish a viable urban farm would need to be developed *in situ*. Very little of this needs to be high-technology. A simple food waste bin that is rat-proof can be developed by local farmers or inventors. Industrialised high-tech solutions are available, as well as low-tech and cheap solutions. In the next chapter, I mention how these can be constructed, and these include reference to high-tech, intermediate and appropriate technology.

The food system includes biological and physical resources, production and, ultimately, retail sales and wastes. The length of this value chain determines the share that farmers may receive but much of the unsustainability of the food system – food miles and excessive processing – draw value from lengthening this chain.

Local producers need to intervene and develop short and immediate value chains and consider engaging with retail and waste. Means need to be found to make wastes in all forms available for processing by local farmers and to communicate this to customers, increasing the competitiveness of production. This can be achieved through communication technology, events and tech such as food waste bins that can safely process food wastes. These food waste technologies have been developed by the enterprise Compost Kitchen in Johannesburg and this shows how such an input-generating system can work in an urban context.

We need to further consider recycling as another ancillary enterprise to the urban farm, as food can also be exchanged for recyclable waste, which in turn can be sold. This strategy includes food waste-for-food, recyclables-for-food and labour-for-food that can ensure customer loyalty, as customers benefit from collecting. This will secure an inclusive relationship with

customers and enable a farmer to become a recyclable material aggregator, and sell in bulk, or process this waste further. What we need is a bit of experimentation and adjustment amongst food producers, collectors and households, hawkers and reclaimers, and such an opportunity can be facilitated in a public event so that we can maximise the learning and activities that are possible.

Information and communication technologies on our cell phones enable a democratisation of innovation, and these afford great functionality to any user. WhatsApp and other platforms, as well as mainstream social media, enable anyone to create and manage networks and groups. These are excellent marketing, community education and enterprise promotion tools that enable an entrepreneur to contact customers directly and is appropriate for a locally based enterprise.

Social media and engagement

Social media constitute a new means of engagement, but these can be blended with real face-to-face engagement opportunities. We will detail how to host a community event at your farm, where you introduce your enterprise and all its production systems, waste exchange systems and bulk-selling specials to the community. The aim of these is to create a local waste exchange for food, loyalty amongst customers, and this lies at the circular and regenerative systems of the enterprise. Social media can bind all these together with good communication.

Enterprise development: Stacking enterprises on the farm

The farm's enterprise development will be anchored by a system of biological production. Hence, we emphasise the harvesting of waste, as this creates inputs and also capital that can be used very productively on the farm. Biological production and waste harvesting will lower input costs but then produce needs to be sold at highest retail price, and we recommend a pricing strategy, grading strategy, bulk-selling strategy, food, labour and education for waste discounts, and integration with linear

retail sales. We can also mention the creation of new products, like seedlings and liquid manure, and paid-for training. Loyalty programmes and community events are also needed to promote and build the enterprise.

To create robustness and resilience, ancillary enterprises need to be created on the farm, and product and service design needs to be blended with these, so that the "farm" is a contained enterprise unit. Collecting recyclables and bio-waste, and exchange this in a food-for-waste system, can maximise the value of produce. The exchange of second-grade quality food-for-waste and recyclables will likely give the farmer best value. Households will exchange that which they usually throw away, and gain value in that way.

When food is exchanged for recyclables, the farmer can manipulate the prices of food so that benefit is gained through the further sale of recyclable materials. The exchange of locally produced food for such a commodity will invoke local savings and create a new avenue to turn local production into capital value. Each farmer must become a waste manager, as waste holds the value that they need for fertility, and, to attract customers through recycling.

Should locally available open space be used for this (the City of Johannesburg's policies have mentioned this), the urban farm will become a means to effect waste planning, food production, and limited industry if the plastics, glass and metal are further processed. All these materials are currently discarded and reclaimed, and the urban farmer can streamline value chains. They form the base of an income-generation system that needs very little capital. The inclusive relationships between the farmer, reclaimer and customers forms the basis of the viability of this enterprise model and is the means to market its products. Interventions should, thus, focus on enabling greater experimentation and adjustments between such groups of enterprises.

In this book is a comprehensive programme of enterprise development that aims at creating viable and profitable urban agricultural enterprises. The last chapters detail how such an enterprise can be built, from the first sales to a comprehensive

permaculture design. We ground this in leading thinking about enterprise and new venture creation and adapt this body of knowledge to urban agriculture and the reality of under-served settlements in the Global South.

Conclusion

The key market opportunities for urban agriculture revolve around the ability to deliver food at below-market prices. This has food security, economic development and local area effects and can enable the circulation of capital multiple times in local contexts before it leaves the area. Food can be made available fresh and nutritious and with great convenience in local areas. This is enabled by waste harvesting and this further offsets prices, enabling an urban farmer to corner a significant set of the local market for food. Waste harvesting is a way to lower prices and create local effects. This will make available significant quantities of biological materials that can be transformed into an input for production. This is the key opportunity – low capital intensity and high value food production – that will create capital in under-served areas. Recyclable materials that are harvested will have income-generating effects and also make an impact on local waste management and local incomes. Organising these systems will rely on community engagement, and this creates ways to manage and govern urban agriculture. These engagement systems will benefit community education and knowledge of nutrition. We are, thus, confronted by a wholistic system of food production that can be extended to creating bulk-buying offers to communities, and further to loyalty programmes.

This chapter detailed the background information which you need to have before you start farming, and it presented a structure for the book. The next chapter lists the essential technologies, both hard and soft, that you need to consider in planning and creating your urban agricultural enterprise.

Chapter Three

The essential technologies for urban agriculture

Urban farmers operate at a disadvantage because of the small scale of their operations. To be viable, they need to maximise productivity on minimal space, and to do so needs technology, from hard technologies to soft human-centred social arrangements that are productive.

Below is a list of such key technologies that urban farmers can consider for their operations. I also elaborate – somewhat philosophically – on how farmers must engage with technology. In all cases, the simplest solution that you can do yourself is the best starting point, and first build a system before you buy anything. You need to think of all the technologies and social arrangements together as a large whole of interacting systems. A single technology, crop or opportunity will not do, and you need to know how all these work together. This is your enterprise.

It is worthwhile to reflect on technology as it is used in large organisations. The most cutting-edge high technology will only be acquired by the largest and most efficient firms. This is because of the cost of such high technology. Such high technology can only be paid off – or 'amortised' – by a sufficiently large factory, with very high production volumes. Hence, the game of technology is a chase for the highest technology, provided it is 'paid off' by a very large investment.

Urban farmers play a different technology game. Here, the currency is low-cost, and sustainable technologies. Sustainable technologies come about in a system of interlocking holons (that make up a wholistic whole) – or *Nxazonke* – which means that each technology on an urban farm should be a self-contained system. Feeding waste food to chickens is such a system. The

waste is converted to chicken protein by this cycle. The manure is then re-used in a next system, fed to earthworms. What you should realise is that the sequencing of biological technologies creates value in every cycle. Hence, you as an urban farmer will aim for simple, robust and resilient systems that would not fail. Sequencing your animals and plants with the natural decomposition of biological materials is the way to go!

This list of technologies has been "workshopped" a few times at *iZindaba Zokudla*. This list can be extended and only those who implement these will know if they work and to what extent they are profitable. This chapter makes suggestions that are meant to open the door to further innovation, and I am only able to describe these technologies in basic and somewhat abstract form and as first-generation iterations. However, they open a path to a further journey of experimentation and innovation, and I am expecting really innovative applications in a second round of enterprise development. The technologies here are described as new technologies for new entrants, and those familiar with them will be able to innovate immediately over and above what I describe.

Thinking about biological technologies

To realise a sustainable food system, we need to build the capacities of farmers to farm sustainably, as this brings forth resources and makes enterprises more robust. This can be achieved by building knowledge and capacities to use biological technologies to great effect. Farming biologically allows a farmer to manufacture inputs themself, and this is perhaps the greatest benefit of biological agriculture. It de-links the farmer from expensive input markets and allows the farmer to produce food much more profitably, albeit at slightly lower volumes. There are many names for this, from 'organic' agriculture, to 'permaculture', 'regenerative farming' or circular agriculture. There are also movements, like the Zero Budget Natural Farming movement in India and Via Campesina in Latin America. NGOs also proliferate, but many are searching for an alternative agriculture that has promise for local jobs, food and income.

A community-based agricultural strategy builds relationships between the farmer and local actors who can exchange resources for food. A biological approach allows a farmer to guarantee the quality and safety of food, as no chemicals are used, and this has immediate health benefits. Biological systems are accessible and inherently safe, and it is in the ability to understand and manipulate them that the farmer can protect and extend their own ability to produce. Biological systems have the capacity to process wastes, and this enables inputs to become cheaper. This creates a new dynamic of profitability around inputs and outputs, and this is where opportunities for profitability lie.

If waste harvesting from consumers can be linked to food sold at below-retail prices, they will be involved in the lowering of their own food prices. This is a real competitive advantage and differentiates urban agriculture from current retail and commercial agriculture. This will create incentives for the exchange of biological resources for food and is a key operation for an urban food enterprise. This creates sustainability and a

new value and revenue stream. This illustrates how a biological approach can be beneficial, not by virtue of its biological distinctiveness, but by virtue of the beneficial relationships that it creates with the local community. People need to see that their "waste" creates a locally produced and competitive product. Biological systems need to deliver value to the farmer and customers, and this can only be achieved by constructing a very advanced and interlinked system of production that exploits consumers' own waste habits and builds biological productivity through an agricultural ecosystem.

Below, I will emphasise the basic technologies that a farmer can construct on their farm to produce at maximum volume whilst building the ecological base of the farm. These technologies all draw on locally available materials and are offered as means to stimulate debate and further innovation in implementing these. Once a farmer is able to use these technologies effectively, they will be able to use additional help and newer technologies even better. However, it really is necessary that the basics of engagement with technologies are understood before substantive assistance can be used properly.

When technologies are combined, or *converged*, circular systems can be created, and benefits start multiplying. When one process feeds a next one, it reduces reliance on financial capital, and this is important. It is necessary to build a net-value-creating enterprise before you accept a financial injection for your farm. The construction of an enterprise is dependent on the identification of a simple net-value-creating transaction structure. You need to see how to put together the first "deal" by streamlining systems and processes, as this transaction, and the enterprise itself, is in fact a number of systems built to ensure this simple transaction. Once you have identified this net-value-creating transaction, you can then build circular and productive systems of resource use on top of that, and once this is achieved, the organisation can respond to new finance. This is because of the productive arrangement between the systems: this will mean that finance will lead to greater sales, but the systems must be there. Never accept finance until you have these systems in place, and until you have traded for at

least six months. You may only be able to repay the funds, if these systems and transactions are in place. If you receive funds before you are able to construct systems, you may lose a lot as you need time and resources to experiment with making these systems and transactions work! You want to be ready to repay a loan before you apply for one.

Enterprise Design

The enterprise design of the farm is where all the recommendations below converge. I set out what this could look like in the next and in the last chapters of this book, where I discuss enterprise development. To make the farm work, a number of key things need to be in place. Small farms are in competition with large supermarkets and their systems. To beat them, a few complex suggestions need to be made, and farmers need to take heed of this.

The reason that supermarkets dominate the food landscape is because they can efficiently organise collective action amongst their suppliers, workers, inputs, technology, labour contracts and employment schemes. Large organisations like supermarkets can interlink this with technology and management styles and draw on a base of commercial farmers. These farmers produce in such high volumes that they must sell their crop as soon as they harvest, if not before. This then builds the wholesale food market, and this is beneficial to supermarkets.

Urban farmers will not beat this system, but they can find value in hidden niches in an economy dominated by large players. The cost of buying, transporting, distributing and selling kitchen vegetables is expensive and complex for supermarkets to undertake, as we discussed in the previous chapter. Urban farmers can deliver these kitchen vegetables at a lower price, and this is the key point of entry into the market. Farmers all need to understand what creates and makes possible this niche and opportunity in the economy, ecology and society. It is by working to protect this space that urban agriculture, as it emerges at the moment, will thrive.

Below, I present these technologies as a list of things that you can do. However, these actions take place in four fields: Enterprise Development, Production, Technology and Engagement. These themes overlap and they inform each other, and you as the farmer need to see how they interrelate.

The Essential Technologies

All gardens and farms need a beautiful name

Without a name, you have no identity, and you cannot build up a reputation and value amongst your customers. A name will bring dignity to your farm, to you and to your area. A name and brand enable people to talk about the farm, and if you farm with integrity, this will stick. This is about signalling to your community that you have their best interest at heart, and that you are there to serve them.

To advertise your name and brand, find someone locally who can design and make a beautiful sign for your farm with your name and "branding" on it. This will advertise the value that you can bring to the community. If you find someone, pay them handsomely, as you can be sure that a good proportion of that money will come back to you in future sales. Use this opportunity as an opportunity to invest in your local area. This will signal that you are committed to your local area. The sign, brand and name are important indicators of your professionalism, and you need to be careful in cultivating it.

Make space on the sign to advertise your farm and its workings, and emphasise food safety, freshness, price, education and community needs. Advertise the prices that you charge for your produce. Streamline this with the *spaza* shop or enterprise that you need to create. Indicate when people can come and buy and try to streamline this to a specific timeframe, so that you are able to work on the farm uninterruptedly. This will professionalise your practice, and stop people wilfully entering the garden for sales, as this will interrupt your planting and other tasks. Making this professional will help in creating a competitive image for your farm. Remember that you are in competition with the supermarkets.

The name of the farm is an important connection to the community that you serve and creates an opportunity for them to talk about the farm and the meaning that it brings to their lives. This name will serve you well in documentation, fundraising and social media. A good farm with a beautiful name will attract customers. If all these features are showcased on the farm, it will really look good, and the produce will achieve the same status as expensive and packaged store-bought food.

Design and planning

The permaculture design of the farm

A farm has to be designed, even if it is small. It will be important to do some good homework on the layout of your farm. Good planning and layout can save you unnecessary effort and costs.

Permaculture design is an established tradition that can incorporate both science and indigenous knowledges into the planning of a farm or any other system. It is actually a common-sense approach to maximising the value inherent to the flows of energy, water, materials, and biology on any site.

Permaculture design can enable you to build simple systems around how these energies flow on the farm and is the first step to a more complicated integration with higher technology. Smaller farms need to engage in this way of designing, as every little bit counts. Even shortening the steps that you take from home to, say, the chicken coop, will lead to savings. This will enable the farmer to make the most of the location, siting and local features of the farm or garden. Do good homework on "permaculture" and "low external input and sustainable agriculture" before you start.

Permaculture design starts with understanding and documenting all that you already have available on the farm. From this moment on, everything on the farm needs to be used, as little as possible wasted, and all wastes processed to a new by-product. Only produce and irrecoverable waste must leave your farm! Permaculture enables all materials to be used in a design process that can stack and sequence various technologies in a meaningful way. Do not simply work the land, you need to design your interaction with the world, the farm and society. You are making a world in designing the farm, and real opportunities lie here. What you have needs to be firstly maximised and used before anything else can be "bought".

Design is the conscious creation of, and planning for, or guiding the building or construction of a thing, an artefact, a process, system or just any idea. To design something, it must be "represented" in some way, as a drawing, a sketch, a computer programme or just in the mind of the creator and innovator. Before you design, particularly an urban farm, it is necessary to know what you are designing for.

You could use design methods and methodologies to design a particular thing, if you know what you want, like a hydroponics system. You could use permaculture design thinking and methods to design an all-round robust farm and resilient processes on the farm. You could be designing for a particular crop. This permaculture design needs to be blended with enterprise development strategies and tactics. This relates to how you price, introduce new products or services and how you build the enterprise in general. It would pay to engage in a

structured permaculture design course, and there are many who offer this service.

In the design of your farm, prioritise the following:

1. **The sun**. In the southern hemisphere, the sun will mostly be in the north throughout the year, save for high summer. Design the layout and the plantings of the farm so that you receive maximum sunshine. This may mean moving large buildings to the south, and large trees and crops, so that smaller cops receive as much sun as possible. Everything must face north.
2. **Water**. Design the layout so that you slow, capture and store as much water as possible, both in containers and the soil itself. This will mean shaping the landscape, so that it contours, and construct as much level areas as possible. Integrate these designs with the paths and further layout of the farm. This is a specialist activity, and will include micro-infrastructure like pits, swales and contours in the soil to capture run-off.
3. **Design for interaction**. The way in which your workers move on the farm, and the way that materials and energy flow, need to be integrated with water and the sun, and all

activities on the farm, so that the least effort is expended. This also includes customers and their movements, and the space that you will use for community events.

4. **Maximum productivity on minimum space**. Your use of space needs to be intensive and compact. Do not waste space and build infrastructure so that you can use space effectively.

There is a lot more to learn, and permaculture design is but a first step. What is important is to experiment and engage with your farm all the time. A key design imperative is to integrate sales with production, and this is a strategic aim: you are here to sell food!

Composting

The garden needs a substantial amount of space devoted to **compost** or input production. Jon Jeavons said that you need one-third of your farm dedicated to this.... This is future productivity and farmers without this will fail in the second year. A system of harvesting waste from customers is necessary to always have enough compost on the farm. Composting is the next harvest, and this is the most important part of the farm.

There are many kinds of compost. Any biological material, if left long enough in a heap, will become compost. This is the fertility that new plants need to grow, and it can be made in simple ways.

The easiest way to make compost is to lay sticks on top of each other in a circle so that air can enter the compost pile from below. Put on top of this any dead biological material, and layer this and cover the material every so often with soil or mature compost. Mix brown and green often. The bigger the better, but bear in mind that the pile will lose two-thirds of its size when mature. You need about one wheelbarrow of compost per square metre every year in your garden, at a minimum. You really need LOTS of compost!

You should devote enough space to compost piles and try to make them look good by housing the pile in a container. Harvesting the juice that runs out is a good thing and is a

secondary product that can be sold and a good ingredient in liquid manure. Certain containers can keep rats out, so experiment with different designs.

Compost should be there where the roots are, where the plants feed. The best is to integrate your composting with a deep trench garden bed. Note that a compost heap will essentially become an above-soil raised garden bed if designed and made in the right way. The idea behind compost is to have more compost than "sand" where plants grow, and the more compost, the better they will grow.

One way to expand your composting is to ferment material as a **liquid manure**. These are effective but must be diluted with water. The idea behind this is to replace the bacteria and fungi in the soil with better bacteria and fungi. If rich "soups" are used, you trick the plants to believe that they live in a highly fertile environment and they will produce more. If these soups are given to a biologically rich deep trench bed the bacteria and fungi will immediately start processing the biological material and you will be constructing a highly fertile soil.

Making liquid manure

Liquid manures are the basis of an advanced approach to agro-ecological gardening. The basics of this is to breed *Lactobacillus* bacteria (that come from milk – milk is essential in good compost) and use this bacterial solution to seed your subsequent liquid manures. This means that you should use milk to seed the compost or liquid manure right at the beginning. Soak the materials in milk before you add waste, salt, yeast or sugar, as described below. This will ensure that the main bacteria in your liquid manure are *Lactobacillus* bacteria, and these are important for crop production. Always dilute your fermented liquid manures – you are making a vinegar – with water and use this for irrigation. On the Internet, you will find very many examples on how to do this.

The safest liquid manure, and the only exception to the above requirement to dilute your liquid manures, is to make liquid manure with ordinary compost or with leaf mould. Ordinary compost is great for a basic liquid manure that does not need diluting. Make a tea with compost and directly add this tea to the soil or your irrigation water. This is the safest form of liquid manure, and all others except that with leaf mould need to be diluted.

Leaf mould can create a very important liquid manure and can be made into a soup like ordinary black compost. Find a forest that is undisturbed, or a grassland that is undisturbed, and find the richest, darkest and most fertile soils. Gather about 4 kg of this and place this is in a container with water, your *Lactobacillus* bacterial solution (or just milk, *Amasi* or yoghurt), starch (from any white meal that has been cooked), yeast, salt and sugar. Stir this once a week. Here, you are cultivating the bacteria and fungi that were present in the previously found highly fertile soil. The bacteria eat the starch, and this is how you multiply them. This can be added to your irrigation water or added directly to soils. This replaces the bacteria and fungi in your soils with apex bacteria and fungi from the highly fertile soil or leaf mould. This is how liquid manures "work" – by substituting the bacteria and fungi in your soil with more productive bacteria and fungi.

It is best to use the recommendations below and supplement them with some own researching and find sources of information – particularly on YouTube – that detail how to make a *Lactobacillus* bacterial solution. You can also use yeast, a little sugar and a lot of salt to stimulate your fermentation mixes as detailed below, and this can help if you do not have a *Lactobacillus* solution, or do not have a milk product at hand. You will be making a vinegar with the materials.

The basics of manufacturing a *Lactobacillus* bacteria "mother" solution for extended liquid manure manufacturing is important, as *Lactobacillus* bacteria is the key bacterial family needed for food production. This can be achieved by first fermenting white starch for a week. Discard the residue and mix the solution with milk and ferment for a week. After one week, discard the residue, and you will have *Lactobacillus* bacteria that you will use as a base for all other liquid manures. Mix this with molasses and cooked starch to keep them alive and expand the solution by adding water. Use a full or half a cup of this to seed your liquid manure systems with *Lactobacillus* bacteria or add directly to irrigation water. Make sure that the solution is filtered so that you do not clog your irrigation system. It may be best to add this to the soil separately from the irrigation.

Recent wisdom on vegetable cultivation has emphasised that you need more fungi in your soil than bacteria and for that, consult more advanced knowledge on fermentation. Dr Elaine Ingham, and Drs Su and Johnson (of the Su-Johnson Bioreactor fame) have made ample information available for further learning. Find a video on YouTube that details how to make *Lactobacillus* bacterial and fungal liquid manures in a bioreactor. In these illustrations, the *Lactobacillus* solution is used to seed liquid manure fermentation of materials like green waste, fish bones, bones, old fruits and manures to manufacture effective fertilisers.

The Su-Johnson bioreactor tradition that is emerging in the media represents the leading edge in the applied science of composting. Composting extracts can be derived from very mature compost piles which are older than one year. A Su-Johnson bioreactor metabolises compost aerobically.

Note that we probably make our compost and liquid manures anaerobically (without oxygen) if we use a simple pile, and here a key lesson is evident. Try to compost with aerobic means, and that means that your compost pile should be exposed to air as much as possible; below, on top, and on all sides. You can also bubble air through your liquid manure (at least for 20 minutes but 24 hours if possible). You can use a compressor or an inflated tyre and let it bubble all day. Fermentation will thus be aerobic, which is what you want.

The Su-Johnson reactors use PVC pipes with holes in to bring oxygen and air to the middle of the pile, and this seems to be key in cultivating the right bacteria and fungi in the compost. This emphasises aerobic digestion and make the shift to aerobic digestion in your composting.

When using such liquid manures in your water systems, you need to think of filtering the soup or tea as not to clog your water systems. However, you can also add them to the soil independently of the water systems and try to "inject" the soups into the soil instead of merely watering. Cover the soup with soil after application between the rows of crops that you cultivate. Add liquid manure between rows of crops and water directly to the rows.

Liquid manures are a simple and effective way to improve fertility. Liquid manure can do specialised things for a garden. **Brown liquid manure** is when you use brown, dry material. Liquid manure made with brown waste is good undiluted as a weed killer and soil conditioner before planting. Anaerobic digestion makes this liquid manure, but the anaerobic digestion increases "dead" bacteria and fungi which will kill plants; hence it is good as a weed killer. Ferment brown matter in water without stirring in a closed container and you have an effective weed killer and soil conditioner. This soil conditioner can be added undiluted to the soil two weeks before planting. This will also burn weeds and may kill some of them after repeated watering. This is a great liquid manure to speed up the composting process, and should be regularly given to your compost piles instead of pure water. Do not add brown liquid manure, even undiluted, to plants, as these contain the "dead"

bacteria and fungi and because it is "dead" it is useful for controlling weeds.

Liquid manure made with **green waste** is rich in nitrogen and can speed up composting and fertilise the soil immediately. Here, specialist knowledge is important, but these fertilisers are easily researchable. Green liquid manure is when you use only green material, like grass clippings, or fresh leaves, and these release nitrogen in your fermentation process. This is rich in nitrogen and can be added diluted to the soil. Nitrogen is needed for seedlings. It speeds up composting. Nitrogen liquid manure can be "manufactured" by fermenting fish bones. Nitrogen-rich liquid manure comes from green manure, from fish and fish bones, and from fermenting legumes like beans. Look out for trees in seed. These seeds, even when immature, can be used to manufacture a nitrogen-rich liquid manure.

Phosphorus and phosphates, which are important for flowering, can be made by fermenting chicken manure, and rotten fruit and vegetables. Rotting fruit and vegetables are high in **sulphur**, which you need for fruiting and flowering. Specialist liquid manures can be made with bones and sheep and cows' heads to generate bacteria and fungi that will release **calcium**, important for stem growth.

For these specialised liquid manures, you are making a kind of vinegar, and this is a process to cultivate bacteria and fungi that starts to break down material, releasing nutrients. For all cases, use a little bit of sugar, one cup, with four to five cups of salt and a packet of yeast to start the process of fermentation, in addition to seeding the solution with your *Lactobacillus* bacterial solution. Add this to the material in a large 20-litre or larger container. Stir once a week and the liquid manure will become ready in about a month. You will smell when it is mature. The rule is, if it smells bad, do not use it (except in the compost heap or to control weeds!).

Wormeries release a liquid manure called worm tea. This needs to be diluted before application. The casings of the worms, the "compost", is highly effective in a tea and this has to be diluted but less than the "vinegars". Casings can be directly added to soil. Wormeries need to be constructed and try

to place a sheet of plastic underneath the wormery (and your compost heap), and contour and shape the surface below this so that the worm tea flows out of a small hole or point below the wormery. This will harvest worm tea passively and use this to develop a specialised liquid manure.

Liquid manures, if diluted, can be sprayed with an old plasterers' brush on plants' and this will combat aphids, but may leave a smelly residue on the plants. Do not do this for two weeks before harvest as your product might still smell of liquid manure.

Strongly aromatic or poisonous plants can be made into a liquid manure that will combat pests. Jimson weed (or "*Malpitte*") leaves, which are stinky can do this. "Kakie Bos" *Tagetes minuta* or "Mbanje" in isiNdebele, and most strong-smelling plants can be used in this way. Spray your plants with the liquid manure with a plasterers' brush and avoid doing this two weeks before harvest. You can cultivate these weeds in the garden to deter pests.

Mixing urine, worm tea, manure and/or some of the specialist liquid manures (and Biochar) makes a new product: packaged liquid manure. This is a high-value product that can be sold locally and further afield. Some farmers are able to sell this at a very high price.

Farmers need to be aware of the uses and benefits of chemical fertilisers. When handling them always use gloves and masks. If you are unsure about them, but have some to use, mix it in with the compost heap. All of this will be metabolised and will, over time, become "organic" or metabolised by organisms. You will not lose this fertility in this way, and it will be safer to use it this way.

When applying chemical fertiliser to the soil, always use it sparingly and try to bury the fertiliser, otherwise you may lose most of it with watering. Do not eat or ingest it and always wear protective equipment and wash your hands twice afterwards.

Biochar

Biochar is a charcoal dust that has emerged recently as an effective way to boost productivity. Biochar, like charcoal, is a porous substance that will increase the volumes of space in your soil, enabling roots to grow bigger and longer in the same space. Biochar holds water and is effective in minimising water use and evaporation, but it can "steal" water from plants. Soak it in water or liquid manure – preferably "green" liquid manure, before applying it in the garden and deep trenches. Bacteria and fungi inhabit a biochar particle, and the crop roots will grow around and inside the biochar particle. This creates volume in the soil and roots can link to material in the soil much easier. Biochar can be added to the soil after immersing in water or liquid manure. It can be added to compost and used to make a specialist compost and liquid manure that can be sold. Some make biochar by adding charcoal dust to animal feeds and harvesting the manure for composting afterwards.

Find charcoal dust in your area, and this may be quite easy to do. Charcoal traders will have lots, and it is a nuisance for them. Mix it with your compost and in this way, you will be adding biochar to the soil over time. If you can make a fire, you can make biochar and try to do it yourself. When making biochar with a fire, let the fire grow high, and then kill 50% of the fire. Add more wood to burn, and when high, kill 50% of the fire again. Do this as much as you can and in the end, kill the fire completely with water. The charcoal can now be used as biochar. It will be best to grind it into a fine powder.

Biochar needs to be mixed with compost or liquid manure to encourage bacteria and fungi to colonise it before applying to soils, but this will take place naturally. It will absorb a lot of water and will make your soils dark and more fertile. Biochar can be made by crushing charcoal to a fine dust. Some sell a specialist biochar, but it is unclear if it is much different to ordinary charcoal. Buy or make charcoal and crush it with a hammer or any other instrument and start using it widely on the farm in all compost and all deep trench beds. Adding biochar to the deep trench bed when you build it is best, as it will absorb water and become part of the soils, fertilising it significantly.

On the Internet, you will find several ways of making biochar. It really is crushed charcoal, and simple tools can be used to make it. You can start by simply using ash and mixing it with your compost!

Deep trench beds

Planting needs to be undertaken in a **deep trench raised bed** or similar technology. The point here is that sufficient fertility needs to be in the ground to make farming productive enough to give the farmer a livelihood. Deep trench beds multiply your efforts and productivity, and without this productivity there is no point in being an urban farmer. Fertility is created or achieved by burying biomatter in these trenches. Biochar can be very beneficial for a trench bed, so try to add a lot to it when building it. Liquid manures should be added to the bed, particularly when constructing it. Brown liquid manure is important in the beginning, as this will speed up the decomposition process and condition the soil. Some say that an above-soil "trench" or "*hügelkultur*" bed is best as it needs less labour, whilst others are satisfied by digging a deep trench and depositing the biomatter below soil level.

A deep trench bed is made as follows:

First dig a trench as long as you want but as wide as two arm lengths. This is to make it easy to work the middle of the bed from either side. Make sure that you can reach the middle of the bed from either side. Integrate the beds in the overall layout and permaculture design of the farm. It will be best if the beds themselves form contours. Make sure that the beds are level, and arrest water on the upstream side.

Dig this trench. You want to have all materials available on site and rather wait until you have sufficient materials available before you construct the bed. You are investing a lot here in your enterprise and it will pay to make this trench as fertile as possible.

Lay down old newspapers and cardboard at the bottom and sides of the trench to make a kind of "bath" to conserve and hold water. Fill with lots of brown liquid manure to speed up

the decomposition process. The newspaper and cardboard will decompose over time and add fertility and create a bath wherein water will sit in the beginnings of the making of the bed, immersing the biomatter and speeding up decomposition. Add biochar, kraal manure and liquid manures from here on and have a lot of this, and ordinary compost, available. Keep the topsoil handy but use the deeper soil in your composting processes and to cover each layer as you fill the trench. In the process described here, have lots of water handy as you want to fill your trench as deep as possible with water and liquid manures when you build it. All of this water will stay below ground, and one day will still be used by the plants… You can also add vertical pipes to the trench, so that you water "from below" and this will minimise evaporation losses.

Fill the lowest part with hard material, like bones and large logs. Logs must not be too large, and large logs bigger than 7 cm wide can best be used to make contours and the downstream

side of a swale on the farm. Sticks smaller than what your hand can wrap around are best, as the carbon–nitrogen mix is in balance. Keep them for the layer above the bones. Bones bring nitrogen and calcium and are highly effective. Some will even add roadkill to the bottom layer, but you may want to feed this to your chickens first… If you only have large logs, keep using them, but try to find green matter to deposit next to it so you correct the carbon and nitrogen balance.

If you can, have lots of compost, chicken and other animal manure ready, and keep some of the topsoil that you removed handy as you fill the trench. You want to pack this trench as full as possible with biomatter and composts as this is the food for your plants in the upcoming seasons. You will keep the topsoil for the last layer, and try to mix this with green waste, and this then creates 'green manure' which is highly fertile and will help the seedlings in the first two weeks of growth.

It is best to use smaller logs and sticks as large as your hand can fit around, in the deep trench, as these have a better carbon to nitrogen ratio than larger logs. Large logs will "steal" the nitrogen from your plants as they themselves decompose, but one day this will be available once again, so large logs are not a bad idea. If you have only large logs, try to fill in the spaces next to them with green manure, chicken manure or cattle dung. Smaller sticks have the right carbon to nitrogen ratio (7 carbon: 1 nitrogen) so add as many of them as you can to the trench. Every now and then jump on top of the material to push it down. The trench will subside and go down as it decomposes so have a lot of topsoil or compost handy in the next two seasons. Add water as you go along, and as the trench gets fuller, add smaller and smaller pieces of biomatter. The top should be covered with good compost and some topsoil or green manure. Now you are ready to plant. Plant shallow-rooted crops in the first year as the trench decomposes.

This deep trench will take many years to decompose, and fertility will steadily increase until you have exhausted it. This may take many years. If you add a wheelbarrow or more of compost every year to every square metre on top of this bed, you may never have to open it up again and fill it again. This is why you want to add as much as possible in the first round of building this bed, and animal bones which decompose slowly, is the basis of this. The more you add to the bed, the more productive the activities on top of the soil will be. This is how you raise your productivity. Every minute spent on a concentrated deep trench bed will give a higher return on investment than merely planting in the soil. By preparing your beds, plants will be most productive, and this is time and money better spent than only watering a crop planted in the soil.

Integrating this deep trench bed with liquid manures will also boost fertility as the liquid manures will immediately begin decomposing the material in the trench. In this way, you can maintain fertility as the bacteria and fungi will immediately start feeding on the material in the trench. You should also add liquid manure, undiluted, to the trench as you build it, especially the brown liquid manures, as this will speed up decomposition. The trench is a compost heap under the ground and will behave in the same way as an above-ground compost heap.

These beds will be the hardest work that you will have to do on the farm, except perhaps building infrastructure. They need to be well integrated in the design of the whole farm. They are a big investment, and you need to plan to build them as you need all material at hand when you do so. Take a few weeks to collect enough material and of the right kind so that your investment will pay off.

Intercropping and companion planting

It is necessary to consider **intercropping** in your planting strategy. It is a good idea to plant marigolds or *Afrikaners* alongside your crops as these combat pests. Some plants also do well with others, whilst some do very badly with others. Consult specialist knowledge about intercropping, as this can minimise pests and create synergies between plants. For instance, legumes like beans and peas fix nitrogen in the soils through root structures, and these make nitrogen available for the next crop. Always plant legumes amongst your crops.

Mulching

The beds need to be **mulched**. This is a key sign of a good farmer. Mulching is next years' topsoil. Leaves, wood chips, grass, plastics and even chicken feathers can be used as a mulch. Mulching is next season's fertility, if it is biological. Try to cover the whole farm in mulch! Mulch could also substitute for the wheelbarrow of compost that you need to add to your beds every year and the mulch decomposes whilst lying on top of the soil. Good mulch will minimise water use, and farmers should aim to cover every inch of surface of the farm with mulch. Mulch should be harvested from trees in the city and from grass clippings.

Irrigation

The beds need some kind of **irrigation** system, and this could be a simple "one pipe" gravity-fed irrigation system or a more complex one. The simplest irrigation, and very effective, is to plant soft drink bottles up to their necks (or upside down with bottoms removed and caps on) in the soil. Puncture the bottles with holes and fill them with water. After a few waterings, the holes will clog, releasing the water even more slowly.

We have developed a gravity-fed irrigation system in the *iZindaba Zokudla*. When you construct a gravity-fed irrigation system, please note the need, particularly in a small set-up, to have the dripper pipes in a "circle" (and not in "dead ends") to equalise pressure on each hole. This is a key design characteristic of a small irrigation system. The pipes overall must be in a circle or complete square so that there are no dead-ends in the irrigation pipes.

The holes can be made with a simple nail, and a bent wire should be pushed through the hole made by the nail. Take shopping bags and shred them a little bit and then push them through the eye of the bent wire that goes through the hole and pull it back into the pipe. The shredded bags should tightly fit the holes on both sides, so that the water has difficulty exiting the pipe. This will allow only a small amount of water to exit, making a drip-irrigation system.

The system can be built with bought or salvaged black pipes and any size will do. Reclaimers often find these pipes as discarded materials, and you can source a good irrigation system at low cost from such a reclaimer. The water container is particularly important. You need to have this at a large enough size, or it must be elevated high enough above ground to create enough pressure to make it work.

A container of any size will do, but the larger the better, and it must also be elevated. Try to add a tap to the system so that you can control the water flow.

An irrigation system primarily releases the farmer from the drudgery of watering the garden or farm. Large systems or lots of small ones can be built. Consider firstly using bottles with small holes in the sides and bottom, buried to the neck in the soil, as these are effective, simple and inexpensive.

An irrigation system should be used or combined with liquid manure. Liquid manure contains solid particles that can clog up the irrigation system and care should be taken when adding it to the water. Filter your water through a cloth before adding to the irrigation system. Use the residue in the cloth in the composting system. The system should be cleaned every so often. It may be best to apply the liquid manures separately to the irrigation system.

An irrigation system is a key piece of technology for any farm, and without this, the use of the farmers' time is undermined. Farmers need to use their own time most effectively and an irrigation system allows you to do new and interesting things on your farm, besides watering.

Seeds

A farmer needs to know **seeds**. Farmers should know the differences between wild seeds, Landrace seeds, Heirlooms, open-pollinated seeds, closed-pollinated seeds (like hybrids), 'guaranteed' hybrids, and genetically modified seeds.

Farmers should also be aware of their 'farmers' rights' regarding seeds. Farmers have a right to save seeds, even proprietary seeds, after harvest. This right protects farmers when they save seeds. Small-scale farmers in South Africa have the right to save and exchange seeds amongst themselves. Hence, it is allowable for a farmer to re-use seeds on their own farm in subsequent seasons. Farmers have the privilege of calling on this right when confronted by others when saving seeds.

Farmers should participate in a seed library, or host one at their farms. This is a complex requirement that is dependent on the networks between farmers. Below, you will find a document detailing the basics of a seed library and how records of such a seed library should be kept. Seeds, however, are becoming expensive, and a seed library can lower the cost of seeds and build networks amongst farmers. Farmers can slowly start selecting genetics for their farms and could potentially develop urban-suited seeds. The major questions and issues that you

need to be familiar with in building a seed library are detailed in the document below.

Below, we make available the basics of starting a seed library. To do this, you need a record-keeping system for seeds received and seeds loaned. This is not complicated and can easily be done. Farmers in your areas may already be doing so, and enquire amongst farmers if this is available.

What you need to know to save seeds

How plants are named scientifically:

FAMILYGenus Species

Common names, varieties or cultivars

e.g. Spinach *Amaranthaceae* (*Spinacia oleracea*)

e.g. Onions *Allium cepa*

e.g. Garlic *Allium sativum*

Note that Garlic and Onions can interbreed: Giant Garlic hybrids.

For Spinach *Amaranthaceae* (*Spinacia oleracea*)

Kingdom: Plantae
Angiosperms
Eudicots
Core eudicots

Order: Caryophyllales

Family: Amaranthaceae,

Subfamily: Chenopodioideae

Genus: Spinacia

Species: *Spinacea oleracea*

Distinguish between the kinds of seeds available:

Wild Relatives – Eg. *Tulbagia* (Wild Garlic) vs *Allium* (Garlic).

Landraces: Wild garlic types (e.g. the purple vs white garlic). These come directly from wild populations.

Heirlooms: When we breed the landraces into stable phenotypes (that which you see). These are the old varieties that we often find amongst our ancestors.

Open-Pollinated varieties: These can breed amongst themselves, and children look like parents. Some are good commercially, others not. When you save your own seeds, this is what you get.

Hybrids: Hybrids are bred in laboratories. Here, we cross a mother and father who do not look like each other: this breeding creates high-yielding commercial varieties. Most of the seeds that you buy are like this. Children do not look like parents, and you cannot save these seeds.

GMOs: Genetically modified organisms result when we introduce genetic material from another plant or animal into a plant or animal. One of the first GMOs was a tomato with fish genes. Certain worms that eat tomatoes are allergic to fish, and when they eat these tomatoes, they ingest fish genes and then they die. GMOs cannot be saved, as they, like hybrids, will not lead to stable phenotypes. There are legal issues when you save these seeds.

CRISPR cas-9: This is an advanced genetic technique that will still bring many new varieties to market. Here, we do not bring new genes into a plant, but we re-mix its old genes to achieve a desired trait and a new phenotype in the form of a better fruit, leaf or root or tuber. This can change indigenous varieties into more commercially important varieties.

Selecting and keeping seeds

Species is what makes any plant unique or distinctive. However, plants in the genus can interbreed, and sometimes even outside the genus.

When you select seeds, you are selecting under the '*Common names, varieties* or cultivars' and are actively changing what they look like, how they grow or produce.

If you want to know more about this, look up **'Taxonomy'.**

Remember that seeds form through pollination or mixing between male flowers and female flowers or the genes – or 'blood' in the common tongue. This mixes characteristics and creates diversity. This diversity may result in new and better seeds. Breeding means to understand how seeds mix and to select the ones that you want.

Flowers are either male, female, or, male and female! Some plants carry only male or female flowers, and others carry both, separate male or female flowers. Some carry flowers that are both male and female.

To grow your own seeds, you need to know if your plants carry:

1. male, or
2. female, or
3. male and female on different plants, or
4. male or female flowers on the same plant.

A plant that produces both sexes in one plant is a one-house or **monoecious** species.

A plant that produces sexes in different plants is a two-house or **dioecious** plant.

Male parts in the flower are called stamens, made of filaments and anthers.

Female parts are called pistils, made of stigma (the tip), style and ovary.

The ovary is where the fruit forms, and the objective of pollination is to grow a seed or seeds in the ovary. When the ovary is developed, we call it the "fruit".

Pollination is influenced by the origin of the male and female flowers. In flowers that are both male and female, breeding is different than if they were on separate flowers.

Pollination is possible by:

- Wind
- Hand
- Insects
- Birds
- Self-pollination
- Isolation
- Distance
- Time of day, season or year.

Can be changed mechanically.

Can be changed by bags or cages around the plant. These can be placed on plants on alternate days etc.

Pollination can also be undertaken by hand.

They say your population size should be a minimum 20 for inbreeding plants (they are adapted to small population sizes) and 100 for outbreeding plants (like those that use wind pollination).

Seed saving

Seeds must be removed, washed and then dried before storage.

Sometimes it is necessary to ferment seeds (often in the rotting fruit) to activate them to be able to grow.

Seeds should be washed if they are to be kept for a long time.

Seeds should be quickly dried after washing so that they do not germinate or rot.

Dry them on a non-stick surface, like a clean plate or glass. Do not dry in the sun.

Seeds often need to be dry processed and winnowed to get husks, pods, flowers or leaves out of the collection.

Hang them to dry.

Thresh them: break the covers in a pillowcase and shake and crush them inside it to stop them from becoming lost.

Winnowing is when you separate the chaff from the corn.

You can also use a sieve.

This is good for cabbage or chomolia (*Brassica* oleracea) seeds.

You can use a bowl, and the heavier seeds will sink to the bottom.

You can use the wind or a fan.

Hot Water Treatment

Use a double boiler to heat seeds for a short and limited period. Do not exceed 50° Celsius!

Get good advice before you do this:

Cabbages, broccoli, chomolia and cauliflower: 20 min.

Eggplant, spinach and turnip: 25 min.

Celery and pepper seeds: 30 min.

Tomato: 25 min.

Storage

There should be no moisture or high temperatures. It is good to place them in a jar in a fridge.

Some say that silica sachets should be used to dry the jar.

Record-keeping

Try to record all the below information for every seed that comes into the library. Get a big book that records everything as they come in. Use the page below as an example of the record to keep.

Good Luck!

This guide was compiled by drawing extensively from Ashworth, S, 2002. *Seed to Seed: Seed Saving and Growing Techniques for Vegetable Growers* Decorah: Seed Savers Exchange.

The Administration of a Seed Library: A Template

RECORD NO.: Y-M-D-No.	
Type of plant	
Genus	
Species	
Common name, variety, cultivar	
Source: Name Address Phone no.	
Date obtained	
Germination %	
Date stored	
Year last grown	
Notes	
Days to maturity	
Season	
Plant characteristics	
Days to seed	
Days to fruit	
Fruit and harvest	
Harvest size	
Type	
Colour	
Shape	
Productivity	
Diseases	
Flavour	
Storage qualities	
Markets	

Animals

Animals need to be integrated with crops to maximise productivity

Worms can further process ordinary compost, and these worm casings are a product that can be sold at higher price than compost. The worms can also be sold, but if you want some, it is best to attract them to your farm with a compost pile. They will come and once you have them, move them to a wormery.

A wormery is basically two containers on top of each other, with a screen, like an old carpet between them (preferably on top of the bottom container), or holes in the top container. Deposit food for the worms – any biomatter – in the top container (which must have holes above the carpet) so that the casings can fall to the bottom container. Worm tea will accumulate in the bottom container.

Small animals like chickens need to be housed in a good chicken coop. Rabbits too, and their manure is a great fertiliser. You would have to be careful as by-laws (see Johannesburg's by-laws: https://bit.ly/4s3tzBH) regulate the keeping of small animals. Up to five chickens or rabbits can be kept by a household in Johannesburg. Find out what the by-laws for your settlement are.

There are others who keep larger animals like cattle and sheep or goats in urban areas. These farmers produce a lot of manure, and I would recommend forming a partnership and building a crop garden right next to the kraals of these larger animals. The manure will enable highly productive farming, and this is a key opportunity that must not be missed.

It is possible to feed animals by sprouting seeds, and this can be done in simple containers that will hold some water. One kg of seed can produce up to 6 kg of feed. Find good resources on the Internet for this.

Bees and insects

Bees pollinate and a farmer with many bees may see higher yields of fruit crops like tomatoes. Ivan Brown has developed the Beegin Beehives (https://www.beegin.co.za/) and these are available as a manufacturing system so that a manufacturer can invest in this technology and thus create a sector of beekeepers. Honey and beehives can be sold.

Breed insects for your chickens. Ayanda Booi developed a system for breeding cockroaches for human and animal consumption – please see: https://bit.ly/4szDr5Z.

Tunnels and infrastructure

A tunnel does not have to be an expensive tunnel

Small tunnels can be manufactured with long bendable sticks, PVC electrical conduit pipes, and with steel rods (8mm is best). See the farming kit Kyle Brand developed in 2013: https://bit.ly/4syuY2R. Another good example is Living Seeds Heirloom Seeds' tunnel manufacturing video, which illustrates a low cost and durable approach to tunnel manufacture.

Plastic or shade cloth can be added to any structure, and some have recommended a simple box structure of welded steel to make a greenhouse. There are real opportunities for welders to develop such light low-cost small tunnels, and this could be done at very low cost. They can also make composting boxes out of steel that can keep rats out.

Tunnels keep plants a little warmer and stop birds and rats from eating the produce. Plants do not know how much you spent on the tunnel, they only want to grow, hence, any structure will do! The deep trench below the ground is most important!

A tunnel is a key investment on the farm. Note that every cent, moment of effort or drop of water added to a tunnel brings more returns than in an open soil garden. Hence, it makes sense to spend more time and effort in the tunnel, as this brings greatest returns. Build your deep trench or raised beds in a tunnel to multiply even further. A tunnel also enables the use of hydroponic technologies, and it will be a good idea to combine these two. I discuss cheap hydroponic technologies below. Please take a look.

Vertical and controlled agriculture systems

Agriculture is proliferating, and we are seeing new and exciting ways to farm emerging amongst innovative practitioners. One area that is ripe for innovation is in the vertical space. People in cities, informal settlements and on top of roofs and in small yards and spaces are pushing the boundaries of agriculture in developing these systems.

Bags filled with soil and compost can be purposed to grow food and they can hang off the ceiling, so that rats and vermin do not eat the crops. They can be stacked on top of each other. I believe there is a really good opportunity here for a creative and innovative seamstress to manufacture bags that are good for growing plants. The design of such a bag could include a receptacle at the bottom to keep water, as growing in a bag quickly drains it of water. This is a real good opportunity for a new enterprise. Old "*streepsak*" or poly-fibre bags can be repurposed as such to enable the growing of crops in confined spaces. There is simply no shortage of opportunities in this regard! The "Amaveggie Pyramid" developed by AWIA (see: https://bit.ly/4d89lSA) is one such an example.

There are also very good container systems available (Take a look at https://sfgtec.com/). Some of these have a built-

in water reservoir that helps a lot with watering. These systems can enable food production even if you have a piece job for a few days, as they can ensure that plants have enough water to grow while you are away.

Hydroponics can be developed at low cost. The cheapest is to fill any container (5-litres minimum) with river sand and add a hole to the bottom of the container. These can be watered two to three times a day with the hydroponic salt solution. If you want to expand over and above this, you can start making your own "systems" with toilet and sewerage pipes. Many sell such systems already.

Aquaponics is when fish are grown in containers, and the fish waste and water is used to irrigate crops. This is a complete biological system but is expensive. This is a worthwhile investment for those who have the appetite but it needs expert help. Aquaponics is a complex endeavour and reveals the dynamics of high capital investments in agriculture. Aquaponics would need a significant investment to be commercially viable and points towards a large system with capital costs. Because you need large scale to make this financially viable, this is best done in a place where you have ownership of the land and are able to afford the infrastructure.

Safety and security

Biosafety is important, but less of a concern if integrated biological systems are developed. Integrated biological systems maximise the flow of organisms and is "dirty", but this "dirt" also creates a diversity that minimises the occurrence of any single pathogen. However, it may be good to think about the following:

- Wash hands before and after harvesting.
- Wash hands before engaging with customers.
- Wash hands after handling compost and liquid manure and after handling animals.
- Minimise the use of liquid manure before harvesting and selling.
- Destroy any plant that looks sick in the field and monitor those next to it.

- Practice biosafety and check your plants and animals regularly.
- Fencing and security is also important. If people are stealing from your garden, plant a row of spinach along the outside of the field, and encourage people to harvest those outside your fence. Try to bring them into the garden by explaining what you are doing and make the food waste exchange known to them.
- Your fencing is a marker of the limits to your farm, and it is important. Try to build a neat fence that will also contribute to your branding.

Enterprise development

From a farm to an enterprise: **Farmers need to understand that the way that they sell is most important in their business development, and this is even more important than how you produce.** The next chapter offers more details. The key features of such an enterprise will be the following:

- The production of food in a safe and healthy agro-ecological way.
- The establishment of a retail presence on the farm.
- The pricing of foods at below-supermarket prices in order to capture the market.
- The development of a food waste exchange system for second-grade food.
- The development of a recyclable system waste for second-grade food.
- The development of a loyalty programme.
- The development of a bulk buying programme.
- The development of community events at the farm.
- Limited packaging and processing: you have to sell per weight just like supermarkets do so that you can show people how they themselves lower the price of foods. You need to invest in a scale!
- A traceability system: let people know how you produce and where their foods come from. Mention that you obtain seeds from a seed library!

- Connect nutrition and good living with the foods that you sell and produce. Take a look at the previous and next chapters to see how we integrate the product design with enterprise development!

A retail system

Farmers lose lots of value by selling to middlemen

All farmers should consider a retail outlet on their farms, especially if the farm is small and located near or in a settlement. The smaller the farm, the more important this is, as it will enable a farmer to sell some or all of their produce at retail price, which is the highest price that the farmer will be able to receive for their produce. The key in achieving this is:

- A small retail outlet will enable a farmer to process and package a bit and allow sales of other goods as well.
- Sourcing from the open market or fresh produce markets. Buy in bulk vegetables that you cannot grow yourself and sell at a low mark-up to build a customer base for your higher-value vegetables.
- Farmers can establish relationships with local *spaza* shops, and they could carry the produce of a local farmer. In this case, the beautiful name and branding of the farm will be important, as this will show the customers what value lies in the food, and where it is produced.
- Your pricing strategy: A 5% "discount" to supermarket prices to establish your market and build it further. You will attract the bulk of the market with this strategy. Aim to give good value to your customers.
- Grading and differentiating products: Divide your produce into first-, second-, and third-grade. This enables many things, from allowing customers to choose the best value for their pockets and to allow selections from bulk, and first- and second-grade produce. Let the customer find the best value for themself. Third-grade should be fed to animals, and second-grade used in the food exchanges. First-grade must be sold at highest price.

- Integrate your food grading system with the food waste and recycling system: Try to only use second-grade for this. This will ensure your profits. Make your first-grade really high first-grade!! This will ensure a higher price (5% lower than stores) and allow shoppers to select second-grade and first-grade together. You will sell for the same price but will offer higher value to your customers.
- Integrate this with a loyalty programme. Integrate loyalty programmes with recycling and food waste for food. Use third-grade food for animals. Identify those who buy larger quantities from you, as they may be selling it somewhere else (and this indicates that your prices are too low!). These customers can enable you to sell everything, and they could be real partners to your business. Find out why they are buying in large quantities and make a good deal!
- Bulk purchasing can be made available on food nutrition and education days and sold alongside higher value first-grade foods.

In the next chapter, we detail the processes that you need to create to set up the above systems.

Distribution and logistics and marketing

Logistics is how you organise the complex activity of distributing your produce. The logistics system has to be focused on the customer of urban agriculture. Because their behaviour needs to feed into the enterprise, it has to be based on relationships and synergies with your own enterprise development. These relationships can be built by using engagement methods and an urban farmer should consider hosting an event on the farm to build these relationships that would become the logistics system that will distribute the produce.

The first thing an urban farmer wants to do is to reduce food miles – the time and distance that food travels to the customer. By eliminating these, the urban farmer becomes competitive. This is important, as urban agriculture can only produce low volumes of food, but at highest quality, and this is what needs to be promoted in marketing – freshness. Logistics

need to enhance this by eliminating food miles and to make "same day" deliveries.

Urban farmers need to identify their markets, and it may pay to focus on immediate markets as this is where the logistics can make a difference. This needs to dictate the ways that the logistics will operate and where the food will be distributed to amongst customers. Find the local market!

Here, customers are important, but additional relationships with hawkers, informal traders, formal traders and others like ward counsellors also count, and engagement methods can create these relationships. Social media can be used to manage and maintain this system, and the functionality of a business account needs to be exploited, as this gives insight into customers and their behaviour. Blend this with an electronic payment system. An electronic payment system can create a database of customers that can be coordinated with other social media services, and this is how a customer database can be created and maintained.

The engagement methods can also "sub-contract" logistics, say with hawkers, and this will also force urban farmers to professionalise their offering. Because someone else may be selling on behalf of the urban farmer, it may be important at this point to develop a brand so that people can know where the food comes from.

This is the selling point that urban farmers need to develop further. A farmer could sign up to a standard like the Participatory Guarantee Scheme (see: https://www.pgssa.org.za/) for organic produce and this could build a reputable brand.

The use of social media can help a lot, as farms can be plotted on Google Maps and farmers can coordinate from here. This will also place the farm on a larger map, and this could reach new customers.

The distribution system will also bring in wastes – through an exchange programme – which can now be identified and re-processed into valuable products, like animal feed or compost or worm casings. Once a farmer is on the map and able to trade, they can use current apps to reach additional markets.

An electronic payment system will also professionalise the sale and leave an electronic trace from the customer on the app (if it has this functionality), which enables a customer to be reached again for new sales.

WhatsApp. The ICT Promise

A good farmer will keep a **list of customers on a WhatsApp group**, and this will be the basis of sales, consumer education and events, and the waste-harvesting strategy. On social media you can also present your branding: With a beautiful name, everyone will know you and you will sell more. A social media presence doubles up as a communication and education channel. It is key to marketing, and to your loyalty programmes. Bulk specials can be communicated through this channel.

Social media is a great way to advertise and to build a reputation as a farmer with high-quality produce. A farmer is a leader in their community, as the farmer is the one producing food, and one who accepts wastes as inputs, contributing to the health of the township or local area and the health of the people. Advertise this and make yourself heard!

Consider changing your WhatsApp or other account to a business account. Start playing with the analytics of the service. This will tell you where people come from and will reveal many things about your customers. React to these and build a comprehensive social media presence in your area.

Events: Engagement and inclusion of stakeholders

Most businesses would see inclusion, trust and engagement as "nice to haves" but not essential for the pursuit of profit. From the above, it is clear that engagement is a key consideration for urban farmers. There may be many other things that make profit possible, but the development of a sustainable and circular business needs to place inclusion, trust and stakeholder engagement at the core of the enterprise. This is because of the convergence of technologies, wastes and by-products, systems and behaviour, and relationships and interests that are combined in a sustainable and circular enterprise.

Engagement opportunities are a lot like a group discussion on an important topic. Anyone can do this, and it could become a feature of your enterprise if you host regular community education days. In this way, you will always be ready to develop new products or services for the customer, and customers will become familiar with how you work, and become active in helping you in developing new products and services.

This approach shows us how an enterprise can incur savings by reorganising people and society. In a sense, the operations of the enterprise, like collecting recyclable materials, takes place outside the enterprise (as customer behaviour does this). However, engagement methods bring this outside behaviour within the sphere of control of the entrepreneur, and this then extends the activities that enrich the enterprise.

This way of organising the community also allows them the opportunity to shape your enterprise and the services and products that you offer. They will feel that they have a say in your enterprise, and this means that you can develop further programmes like loyalty programmes and also organise events like a harvest day.

An entrepreneur should organise an event at the enterprise, and this will set up a system of engagement. In this event, the entrepreneur could aim to set up a **recycling facility or food-for-waste system at their enterprise**. An event could be organised that would have to start with the basics of consumer education about good food. This is 'fresh food', and every urban farmer should realise this is the unique advantage that they have in society: to be able to sell food at retail level that is very recently harvested. The consumer education should go further and show the importance of conserving and enhancing the soil, as this guarantees good fresh food (and deals with waste in general). This can be achieved by processing food waste into compost, and people need to be shown how this takes place. When they see the dark compost, that smells rich and hearty, they immediately see the difference with stinky rotting food.

You, as the entrepreneur, need to start a process of education on how they can contribute to the improvement of their own quality of life by cooperating with you, the urban

farmer. This sequence of events and incentives that you create, is in fact, the core operation of your entire enterprise. You build the enterprise based on the behaviour of your customers. You want to keep them close and secure their inputs into your enterprise, as this will sustain you over time. A food-for-waste system that would enable the entrepreneur to collect recyclable materials in exchange for discount on food sold would realise this new process in your enterprise, and this can be set up with an engagement process.

In proposing this offer, people could be organised into a workshop. This workshop could ask the following questions to your customers:

- Are enough recyclable materials available to make this worthwhile? How much recyclable materials are available from an average household? This would include plastics, metals, glass, paper and others like batteries, and food waste like old cooking oil. We think that each person generates about 100g of food waste per day, and this can give you an idea of what could be available.
- Would people be prepared to change their behaviour and bring these materials to you? Let them know that you are not bewitching them by processing their food waste!
- What would the enterprise need to accept recyclable materials in an acceptable way? Do you have the right technology to accept these (and this would mean acceptable containers for the recyclables and the food waste). Build a steel cage to process compost safely.
- What else can be "doubled up" to ensure savings for the customer and loyalty for the enterprise? (After asking this question, you can start introducing your food-for-waste offer.)

Environmental and social governance and "community benefit"

Many farmers aim to "benefit" the community with their farms. Please note that the most important impact that you can create for your community is to sell food at a competitive price. This

must be the highest achievement that you can make, and this enables people to thus spend their own money much wiser.

Engaging with the community is, however, important and this is undertaken to ensure future sales and customers. Many farmers use such engagement to educate learners about good food as the learners perform some labour for the farm. The organising of such community events can mobilise labour for things like planting, and this brings people into the farm. Integrate this with your loyalty programmes so that learners and their families receive good value and training from you for the labour performed. This process can release labour to beautify your farm, and the place, often a school, that gives you the land.

Do not sell yourself short when organising such events but also invest in the community, as they are key in your profitability. Keep in mind your leadership position as a farmer in the community: you can help with waste, beauty, education, learning and eating.

Compliance land and access: informal and formal tenure

The most important part of an urban farm is the access to land. Many can help in this regard, and keep in mind the by-laws of your city, as there may be some support for gaining access to land.

Many farmers succeed in signing a lease contract, often with schools, to gain access to land. Try to gain security by having the lease run for more than 10 years and speak to farmers who have succeeded in concluding leases to gain access to land. When concluding a lease for land, make sure that you can transfer the lease to someone else. This will allow you to "sell" your farm – at the cost of building deep trench beds and infrastructure.

When concluding a contract to gain access to land, note the following:

- Time duration: you want at least a 10-year lease.
- Water: Make sure that all costs and access to water are clear.

- Electricity: Make sure that all costs and access are clear.
- Infrastructure: Make sure that you will keep ownership of all infrastructure that you build.
- Levies, rates and taxes: Make sure that you know whether you are liable for this.
- Waste: Develop a waste harvesting system so that you keep your farm and the school neat and clean.
- Schools: Schools have ample land available, but they may ask that you give something in return. Even if you deliver food to a school feeding scheme as part of the lease, record how much you deliver for record-keeping and to justify your involvement in the school.
- Teachers: Link with teachers so that you can use your garden for entrepreneurship education, nutrition education and to build relationships with the teachers. Teachers are a first customer!
- Learners: Learners can be used as a form of labour but note that this will have to be reciprocated. Give training and food in exchange for labour.
- SGBs: Let the school governing body or authority know what you are doing and let them understand the impact that you are making. Organise activities like refuse collection, to benefit the school.
- Parents and learners as clients: Parents and learners can be easily linked to food-for-food-waste and recyclables schemes, and the bulk-buying schemes.

The above constitutes the minimum that any local, township or emerging farmers can do to be productive and capable. In the chapters that follow, we will detail how to implement the systems spoken of above. In the next chapter, we take a look at the four fields where action is required to set up a viable urban agricultural enterprise.

Chapter Four

Enterprise development for the urban farm

Introduction: Thinking about product and service design for urban agriculture

We have discussed the overall approach to enterprise development and mentioned the idea of a unique value proposition for urban agriculture. The UVP and your enterprise, including its systems, operations, resources and opportunities, how the enterprise should be designed, and how it fits in with society, should guide us in building it. The previous chapter detailed the technologies and social arrangements that you can use in building this enterprise. This chapter and the next focus on starting and developing the enterprise, and after that, the next two chapters focus on building the enterprise further, and its compliance to laws and regulations and the strategic management of the enterprise, including its finances.

The overall approach that we are chasing is enabling local capital – and value – to circulate several times in the local area, before it leaves through spending on distantly produced goods and services, especially food. This is one of the keystones of the strategy that is detailed in this book and underlies the long-term viability of the enterprise. This calls for the development of local systems of circulation and exchange. This is the *Nxazonke*: the individual systems should all interrelate and build value between these sub-systems.

The suggestions that I make come from time spent in interaction with farmers. Many of these suggestions come from them. Many others are gleaned from the Internet and other publications. How I combine them is, of course, my own

creative work, but the way that I articulate it is also mindful of a critical analysis of the food marketing system, and the place of small-scale and urban farmers in it. I am trying to find and create a niche market for them in the gaps in the market and the ecological failures of the current system. Here, where informality, ecological opportunity, economic productivity and food intersect, an alternative system is possible. This system can metabolise and process urban wastes into agricultural inputs. It can sell effectively. This system would have to organise communities, both as customers and suppliers of such urban wastes, as part of the enterprise. Its sales, marketing, branding and identity, and products and services, are deeply intertwined with these communities, and it is this that brings a competitive advantage.

The local production and processing of wastes need to be seamlessly integrated with enterprise development. The form of the enterprise that results from this integration of waste processing with sales will have regenerative and circular features. To do this, we discuss the process of enterprise development and how you should go about building this enterprise. I have proposed a retail model for this urban agricultural enterprise that adapts and implements the idea of a circular enterprise to local conditions. This is the material which we will work with, but this chapter will describe the processes that you should set up in your enterprise. In a separate chapter, I detail what you can do to start such an enterprise.

We will describe careful steps, one forwards, and two back, in setting up the enterprise. We will emphasise the opportunity for learning in developing these new approaches. Urban agriculture is unusual, and communities will take some time to become familiar with it. The way that we will do this is by careful experimenting with product and service design, by implementing it, and then reflecting and learning about these new interventions. This is a careful, safe and low-risk approach that will stand urban farmers in good stead as they attempt to build and expand their enterprises.

Retail development: Building the UVP of urban agriculture

To really "build" a business we have to understand how a business figures in society, as society gives it a reason to be and creates the needs that business satisfies. In the chapter on compliance, I detail the social contract that underlies the need for compliance and registration. The social contract is an "unsaid" arrangement that underlies society and our consent to be part of it. We give our consent to those in power, but in return we expect benefits from society. The most important benefit is that society should protect you and all of us. That is why we need to regulate business, so that it creates value for society and not only for the entrepreneur. For urban agriculture, it is the farmer who has to pioneer this contract and create the benefits and trust that are needed to trade.

What a business offers, stands in a certain interaction with what other businesses offer, in addition to being in interaction with social needs, and customers. The way that a business defines itself is in interaction with others, but the dynamics of this interaction favours difference and the creation of something unique to each business. This uniqueness could be part of any feature of the business, and could include the product, price (often most important), or even something like location and appearance.

The creation of a business and its identity depend very much on the consistency between the activities that occur in the business and the product or service on offer. If one wants to create an "organic" product, there has to be consistency between this final "result" and the ways that it is created.

The "unique value proposition" of a business is the unique selling point and advantage that the business has, and this shapes the interaction between the business and its customers, and the interaction with other businesses. It guides the entrepreneur, the business plans of the enterprise, and the way that the enterprise functions in society. In this chapter we will discuss this UVP for urban agriculture. What is it that urban agriculture can offer the world? What about this UVP is important and how can we build and enhance this?

This competitive advantage is the source of community and human benefit, both in the form of products – food – and the value and processes that they can command. It is by lowering food prices that deepest impacts on food security, hunger, cuisine, industrialisation and human development can be felt. To sustain such below-and competitive-with-market prices would need the farmer to be skilful in harvesting inputs from the community, and exchange these for the value that they pay for food. Somewhere in the farmers' value chain, inputs or processes are needed that deliver outputs at below-market prices. The craft of enterprise development is to sustain this below-market price throughout the value chain and deliver a product or service cheaper than competitors. An urban farmer has many opportunities in the value chain to lower the cost of a product lower than what others offer, and this is the key competency of an entrepreneur: you need to tinker and adapt each process in your business until you find this below-market point and sustain this saving throughout your enterprise.

The economic opportunity for alternative production means for fresh "kitchen vegetables", is also created by the long supply chains of industrial agriculture. These may be appropriate for grains and high-value fruits, but add an unnecessary logistic cost – transport, processing, or distribution, to vegetables that can be grown in a wide variety of places. These vegetables are also the cornerstone of a good human diet, and lowering their costs, offset by free ecosystem services (which will produce at below-market rates, as commercial farmers do not use biological technologies extensively), will have clear human and economic impacts.

Farmers in industrial agriculture receive a small fraction of the final value of these products. Urban agriculture can be independent of these systems, provided that it finds a way to manufacture its own inputs and commands the whole value chain from production to retail. This is when prices can be lowered, beating those of established retail. However, to establish a lower-than-retail price, the service of the ecosystem needs to be linked to the enterprise model. This is how the niche for urban agriculture can be created.

Urban agriculture's unique value proposition

The unique value proposition for urban agriculture, can thus only be:

> The creation of a price-reduction mechanism for urban agricultural produce through the local recycling and repurposing of waste.

The ways in which the community is engaged in this model is important. To continue with this model, the benefits to the consumer of participating must outweigh what they would receive elsewhere. The benefits to the farmer would lie in receiving the waste at better-than-market rates, and hence, this advantage must be carried through the whole value chain. It is necessary, if a biologically based means of food production is adopted, to secure significant and abundant quantities of biological matter. The relationship between the urban farmer, their customers - and some other stakeholders - is important here. This waste exchange relationship must harvest significant quantities of waste, at lower-than-market replacement costs, to offset the reduction in price that the customer will receive. This will be beneficial if a fair price between these interests can be achieved, and this can only be established through trial-and-error by farmers, in an engagement process with their communities.

Integrating the unique value proposition with your urban farm and shop

The above exchange schemes, together with the price at which you sell, is the heart of the value proposition that your farm makes to society. This arrangement is very different than a normal consumer could expect from a supermarket. **What is important here is that you are enabling the consumer to lower the prices of their own food by their own behaviour – by bringing recyclable, food and other waste to the farm.** Note that each person consumes more than R800 of food per month, and we have calculated that up to R304 per person per month is available to spend on vegetables and fruit. This indicates

what could be spent on the kitchen vegetables that you grow on your farm. This transaction mechanism underlying the waste exchange, I believe, will enable you to gain access to and keep the majority of customers at your farm. Be aware at all times that you have a clear competitive advantage over supermarkets because the large and costly value chains that they have established. In addition to this, you have quite a few additional strategies and tactics at your disposal to either lower prices of inputs, or to optimise a process in your enterprise in order to cement and consolidate your position as a leading producer or retailer in your area.

Starting the business: Do not start with a "big bang", where your enterprise is completely built and structured. **Start with the first transaction and build upon this. Start with what you have!** In the next chapter, I discuss how to start an urban farm with very little money. You can use and try these suggestions. You can also use this to start a new revenue stream on your farm and note that the act of enterprise creation is very much the same as the creation of a new product or service. If you want to know more about the approach to enterprise development that inspired me, take a look at the idea that we need to "effect" our enterprises.

Focus on these first transactions that you can make, and do not take any unnecessary risks when you start your enterprise. You have to keep yourself safe. **Only "wager" what you are prepared to lose.** This means that you should invest and take some risk but only take a risk with an amount of money that you are prepared to lose. This is how you lower risk – by not going for a 'big bang' enterprise launch. Start one day, say, with buying food in bulk and selling it like a hawker. Do this not to make money, but to understand how people spend money on food. Do this as a way to learn about customer behaviour.

If you see this is "working" for you, then you can establish it properly, and consider how you can expand this system and save even more. A next step would be to collect recyclables, for instance, until you have enough to finance seeds and labour. Take a look at the next chapter that details how you can start an urban agricultural enterprise. You should go forwards in careful steps, and retreat and learn, before you either expand or stop this new way of selling. This will lower risk and if it does not work out, you will not lose everything.

When you fail in selling or recruiting a customer, do not despair, but see what you can learn from this failure. Let's say that you tried to sell seedlings. You invested in trays and effort and now have a lot of seedlings. No one came to buy from you, and now you have a lot of unused seedlings available. Immediately stop and reflect what you can do. The seedlings have great value. You could simply plant them, but you may have already planted in your own garden. There may be many options still to safeguard the value in these seedlings. You could give them to another farmer and arrange to get 50% of the crop sales at this neighbouring farmer. You could also bring a new piece of land into production. You could also make these seedlings available to the community surrounding the farm, so that people can grow them at home. You could do this, as you can then sell your liquid manures to these farmers. In effect, you are creating a market for your liquid manures by giving the seedlings away for free. This may still pay you some profits!

There will be many failures, and you need to be resilient and be able to learn from each failure. Remember that you

cannot predict the future, and the future is inherently uncertain. Rather aim to influence the future and people's future behaviour, than wonder what will happen.

Your business is the unbroken chain of transactions that takes place through you as the entrepreneur and through your creation, the organisation that is your enterprise. **You will be building a patchwork quilt – or *Lappieskombers* – of partners, stakeholders, customers and technologies etc. that is your business.** By giving away seedlings in the hope of selling liquid manure, you are stitching together the customers and suppliers to your business. Your business is thus a web of relationships of stakeholders and keep them close to you. Think about how your actions will influence their behaviour and try to influence their future behaviour so that they will more likely buy from you. Here, your communications and media will stand you in good stead, as these communications are what sustains the business (and of course a good price point!)

This patchwork quilt comes from the unbroken chain of transactions that is the trade of your enterprise. To safeguard this chain or quilt, you need to build your enterprise. **You must be able to adjust and react quickly to information from your customers.** By adopting new production patterns, new technology, new products and services and new engagement means, you are keeping together the activities that is your business. The business is the transactions that you make, and you do not need infrastructure or anything really to start it. By having records, infrastructure etc., you build the business better, but do not be scared to start with nothing. Start immediately to keep records and do so on paper. Then start selling, and record everything, even your thoughts.

The things that you could consider are the following:

- Set your price point as lower or equivalent than your competitors. Setting prices lower than others is a sure way to attract clients, and keep in mind that they are mindful of travelling, distances, and inconvenience. Set your prices as lower than local supermarkets and advertise this on the fence or wall outside your farm. They may buy from others at higher price if it is easier to get to them. To combat this,

make the farm a pleasant place to relax as this will offset distances and inconvenience. The point of the food exchange service and other strategies that you adopt, is to enable you to set this price as lower than others and offer better value than others. This is paid for by the waste. Concentrate on setting up these systems so that they pay for you.

- Emphasise the freshness, local character and benefit to the community of your enterprise. Your enterprise is, in fact, creating value and capital in the way that it operates. By producing food out of waste, you are creating capital that was not there before. This value translates to lower food prices with the effect that people can now live better. Over time, you will benefit the community.
- Emphasise the local circulation of capital. By producing from waste, and by trading locally, you are stimulating the local circulation of capital. The aim of this is to let capital circulate locally before it leaves the area.
- There are many more narratives that you can mobilise to promote your farm. Biological and agro-ecological production, and its sustainability is another. Local benefits, like jobs on your farm, educating the community, and streamlining relationships with the state, NGOs and communities is another narrative that you can use. You should be an active seller and mobilise any story or news to promote your enterprise.

The farm / shop enterprise

You should be thinking of yourself as a producer or retailer, and this hints at the character of your business. You need to integrate the food exchange schemes with your food production systems, and supplement this with your pricing strategy, your grading of the produce (first-, second- and third-grade. Third-grade should be given to animals and second-grade for the waste exchange schemes), your bulk-buying events, your loyalty programme, and the events that you hold. It is in the integration of all these functions, and the development of multiple enterprises or multiple revenue streams, that you will create this unique value proposition. The suggestions

below should be implemented as experiments and create time for yourself to reflect on how this takes place and be ready to change and optimise these activities.

The brand and name of the farm

You should have a beautiful name for your farm, and this anchors your farm in the minds of your customers. Try to add a phrase that indicates that you are collecting waste, and that this can be used to lower food prices: "Jabulani Farm and Waste exchange". Something like this will create an imagery in the minds of your customers and this is the cue that you need to build on this imagery. This imagery comes from your UVP and elaborate and build upon this. Once again, implement this, and then reflect on it.

Your shop

The presentation and experience of buying at your shop is important, and you will get the customers back if they enjoy spending time with you. Organise activities at the shop, from food education days to bulk selling opportunities. Your shop must become a place of celebration and good food. Once you are ready, start to introduce new products (also convenience products like any other *spaza* shop). You could do this in partnership with a neighbouring *spaza* shop or do it alone. Once again, start small, and do not wager too much money on this. Buy some of these products, try to sell them, and reflect on how this took place.

Selling and the customer experience

This may be one of the most important aspects of your business. Customers need to enjoy the time spent at the farm. You can enhance the experience by making it look neat and tidy and presentable. You need to look like a decent shop and use the space available to maximum effect.

You are a farmer and what you sell is very different than what we may expect that a normal shop would do. The experience of retail buying from a farmer in an urban setting is

unusual, but we want to find a way to institutionalise this. You thus need to make the most of the beauty and appearance of the farm. Take the time to talk to your customers, as there may be small things, like opening hours, or time spent in waiting, that may not appeal to them. This could help in setting up hours for sales on your farm. You need to structure your time well, so that you have enough time to both sell and work on the farm. Here, you would need to experiment a lot to find the best way of selling.

You will also be hosting events where you sell in bulk and educate the community on the benefits of local food production and the nutritional advantages of eating fresh produce. This needs to be integrated with the customer experience. When people buy, let them learn a little bit about the plants and animals that supply them, let them see the beauty of the flowers and produce that you grow. Let them understand the intentions of the urban farm: to deliver good food and bring additional benefits to the community. You can experiment with facilitative methods at such an event, and you can use the interaction at such an event to gain great insight into how your customers would want to buy.

Integrate the customer experience with how the plants grow, how the waste is processed, and with the impacts that the farm makes on the community. Develop a little tour of your farm so that customers know what they get from you, and how they can contribute to lowering their own food purchase costs. This will release a lot of information, and you can react to that.

Packaging and presentation – even with nothing

Why? This is an important feature of your business and even if you simply tie bunches of spinach with a string, the reason why must be clear. It is good to sell without packaging but the reason for this must be clear. This will lower costs, pollution and waste, and this must be emphasised together with the impact that the enterprise aims at. This enterprise must put the community's health and well-being at centre, and this is a unique selling point.

The food exchange service

You are now providing both a service and products to your customers. The service is the management of the waste of your customers. This service flows into your production system, and the system of exchange and processing (composting) is the link between the service and the product price.

This system will be unusual for your customers. What you need to do is to showcase this system to them in an event at your farm or shop. You have to show your customers what happens to their food waste, and the recyclables that you harvest. They must see how your compost pile or cage works, what your wormery looks like and how you use the compost in the soil. This will show them how you turn their waste into value, and this will integrate them into your enterprise. This can be extended so that they also understand how the biological systems stimulate fertility and, hence, higher production. They need to see how they influence this higher production, as this influences the price that they will pay for food. Now you have a system in place that you can enhance, maintain, and establish with community engagement methods.

Production systems and sequences of biological cycles

The sequencing of biological cycles is what creates fertility and moving material, like food waste, from one sequence to another builds value. You should first of all, feed food waste to animals. Animal manure should be composted or fed to worms, creating another cycle. After the worms have processed the waste, extract the tea, and sell excess worms. Take the casings to either a liquid manure system or compost it. A part of the final compost should always be used to make a liquid manure or compost extract, and to stimulate the new batch for the future.

Many add several additional systems. Animal manure will attract flies, and the manure can be left out in the open to attract them. After one to three days, the worms will emerge, and this can be given to chickens who will find the worms and eat them. After this, earthworms can receive the manure, and value can be extracted from this as well. After removing worms

(which can be fed to indoor chickens) and the tea, sell them, and the rest can be used for compost in the soil.

Showing customers how these systems work, and their place in it, will convince them of the acceptability of this way of producing food. This system includes the customers and their experience of engagement with the enterprise, which is what will keep them as customers. This experience can be created and enhanced by hosting events at the farm.

Bulk buying / selling days

If you establish a retail presence by developing a shop, you have a base to work from. From this base, a lot is possible and can build on and be combined with the events that you host.

Consider hosting a bulk selling day where you sell staples in bulk at a low mark-up in order to attract customers to your own produce. Try to sequence it with a harvest day when you

may have a surplus of say, spinach, or a day when wages are paid. People will need spinach to eat with the staple. You can build clientele and loyalty, and market the day as a "food for the community" day.

To organise this, you need space and perhaps other amenities like tables and chairs. You would need money to buy the staples in bulk, but if you do not, consider this as an exercise in finding a way to host such a day without money. Below are a few options to consider when planning this. If you do not have money, do not despair, as you will never have enough money to expand unlimitedly. Learn how to deal with insufficient money and improvise!

Some of the many alternatives include:

1. Partner with a bakkie trader to get the staple delivered. You could, as an experiment, offer them to sell this at their price at your event. This will be market-related price but could build customers.
2. Partner with a bakkie trader, after you have built up enough customers. Now you can negotiate a reduced price from the bakkie trader because of the numbers of customers. Now you can offer real good value to your customers.
3. When you have enough capital, negotiate with a bakkie trader and buy a whole load outright at a highly reduced price. Now you can start playing with prices to see at what price you could sell the staples to your customers, and if this arrangement pays.
4. If you can, you could partner with a commercial farmer instead of a bakkie trader. Farmers would be reluctant to do so, but you may find the right one at the right time. Try this with green mielies, maize meal, potatoes, or any other crop. It may be that farmers have surplus to sell, and you may get it at a very low price.

After you try the above, reflect on how this took place. You will identify challenges and bottlenecks, and in a next round, try to fix these. Give yourself enough time to find the sweet spot where this is working! Spend time with the bakkie trader and

discuss this opportunity. You may both together find the right solution in no time.

Additional enterprises at the farm

Your events act as a way to educate the community about the benefits of your produce. You should be aware that you as an urban farmer can deliver highest quality of the kitchen vegetables which we consume, better than anyone else. Your freshness is one hallmark of your UVP and emphasise this. You have now established a base upon which you can build a loyalty programme (for surplus harvests), a bulk-staple buying club, and in fact an enterprise.

Establishing an enterprise – a shop – enables you to sell consumer goods in addition to bulk specials and other offers. This enterprise will grow and sell food, harvest food waste, collect recyclables, collect high-value biowaste, host events and make available special deals like bulk buying specials, in addition to consumer products. You could be very creative in setting this up.

You could host other enterprises at your shop as well. Note that there are quite a few local industries in our townships, from furniture manufacturers to clothing manufacturers. They may be interested in occupying space at your farm, and this will be possible if you can attract sufficient numbers of people to your farm. Your farm may become a community centre or a "corporation" …

A database of customers

When you are selling to a small number of local customers, the nature of your communications changes. You are primarily interested in contacting and communicating with people who live close to your farm, and who live closer to your farm than to any other farm or shop. In the future, we may see many new urban farms emerge, and you want to keep your customers. You need to develop a database of these customers, and this is best done electronically.

WhatsApp and SMS systems limit the number of people who you can contact and message. In these cases, you simply have to develop more than one distribution list, and the database of all your customers is the consolidated distribution list. You can also broadcast on WhatsApp. Note that if you keep only someone's phone number without a name on a database, it does not incur any compliance with the POPIA (Protection of Personal Information Act), and you are free to keep people's phone numbers without names. However, if you keep names and phone numbers together you incur compliance with the POPIA. Two things are important: You can keep information if it serves the purpose to which you will use the information. Hence, if someone gives proper POPIA-compliant permission to keep and process this information to make sales, then you are free to do so. If you record sales, what people buy etc., without any identifying details, then you are also free to do so.

Engagements and events: how to keep it all together

To organise an event, you do not need to be an expert in engagement. Give your customers a free lunch – and make it a salad! Organise an event that includes a tour of the farm or shop and all the systems. Take a group of people through your farm and show them how you produce food. Show them your food exchange systems, including the recycling systems. Show them the shop. Talk about your intentions to produce food, allow customers to influence the price, and set your price point. Talk about the deeper effects of operating a farm in this way: over time, food prices can be lowered and the general human development of the community, as well as waste management, will improve.

You should extend your face-to-face events to social media. Even SMS is relevant here and is sometimes a cheaper option than WhatsApp. You need to establish some kind of online relationships with your customers and a message service like SMS and WhatsApp may be all that you need. Should you engage with platform social media like Facebook, Instagram etc., you need to note the data costs, but this can also be effective.

Use these forms of **advertising and sequence them with buying behaviour**. In South Africa, social grants are paid in the first week of every month. Wages come in at the last week of the month. Government employees are paid on the 15th. These dates are important for planning your sales and sequence your harvests and your events with these days. On these days, you need to catch people before they spend their cash. If you have a big harvest outside of these days, you will need your distribution lists!

Social media, business accounts and record analysis

WhatsApp and SMS systems themselves do not record analytics, but if you have a business account on WhatsApp, then the account will allow you to analyse the information from those who have contacted you and with whom you are dealing on WhatsApp.

However, you can do very well with **paper-based records**, and you should always have this as a primary register of transactions and as a back-up if you transfer all to electronic records. Electronic payment machines also keep a record of transactions, but no notes and details. If you are a registered company, you need to keep records, and simple income and expenditure records will be sufficient. If you can add details

on these records, it will be better, but if you use a registered auditor for this, they will be able to tell you what they need you to do, in order for them to do your books for you.

When you make sales, try to, in addition to recording this on your income sheet, note the following:

- Date, Day (week or weekend).
- Time.
- The person (a description would be sufficient – like a child, woman or man, etc.).
- Did they exchange food waste and/or recyclables?
- Are they on the loyalty programme (if you have one).
- Are they on the database?
- What did they buy?
- Volume or weight of produce.
- What price?

Take a look at your records every day, every week, and every month. You need to take a look at these to see if any trends or patterns emerge. This is important for your sales strategy. For instance, you will probably notice that you get lots of people buying right after the social grants' payday on the 1st of every month. You will notice an uptake also on the 15th and onwards, when government employees receive wages. The last week of the month is when wage earners will normally receive their wages, and you can expect sales to pick up on these days too. This can enable you to adapt your harvesting and other calendars, and you will see on what days sales will be low, and on these days, you need to double up and work in the garden. Knowledge always creates new opportunities!

If you have a business account on WhatsApp, and if you use a Facebook account to contact your customers and stakeholders, you can analyse the data that this generates on the analytics feature of these computer programs. This will be very useful, and you can gain a lot of insight from this. Play around and see what you can learn and see how you can react to this in your business operations and systems.

Partnerships

Partnerships will be key in setting up the systems above, particularly in the early days of the enterprise. Partnerships need to be approached with some thought and circumspection. They are experiments that need to be implemented, reflected upon, and then changed if needed.

You have to understand the interests of your potential partner and understand that they are also seeking value in such a partnership. You should also know your own interests in approaching a potential partner and be aware of what you are able to offer, and what you need to get in return.

It may benefit us to think of the "game theory" of partnerships. In a partnership one partner may exploit the other partners, or you could compromise your own interests. You should approach the partnership in such a way that you want to find the "sweet spot" where your interests and the interest of the partner is secure, otherwise there would be no reason to engage in such a partnership. Be aware, however, that one partner may compromise their interests in this partnership, and this could undermine the whole deal.

You need to know what would benefit your partner, as you need to know what lies in your own interest. Approach this negotiation with integrity and honesty, as this will condition the relationship. However, keep your eyes on the business that this may generate, and let the business, and making the deals, lead this relationship. This is not about "getting" something from the other party, but the creation of new opportunities that would not be there if both of you were alone.

Stakeholder engagement

In this chapter, we have spoken mostly about customers. Customers are direct stakeholders to your business and farm, but there may be very many important indirect stakeholders. These indirect stakeholders could include your "landlord" from whom you gain access to land, the teachers at the school where you rent land, the ward councillor, or a farmer who supplies bulk staples. It is important that you cultivate good relationships

with these stakeholders. They will influence your business significantly, as they talk to others in circles that are outside your local area. This will build general societal support for your urban farm, and for urban agriculture in general. Note that, in a real sense, the partnerships are also part of your business.

Contracts and enterprises

Engaging in a partnership will introduce you to the world of contracts. The terms of the partnership should be seen as a form of contract. It is important in this regard to honour the written and spoken word, and to build your integrity and trust based on this contract.

You will have to deal with contracts, particularly for land, sooner or later. It is possible to gain access to land for an extended period, but this should be secured in a contract. Make sure that the language and terms of this contract is "enforceable" by a court, and the contract must be "professional" otherwise you may lose your land after a dispute. Be mindful of those who used the land before you, and the interests of the landlord.

In a subsequent chapter, I talk about compliance, and part of this is engaging on the social contract with politicians, officials and others in civil society. Urban farmers need to be prepared to do this, and this creates their "licence" to operate in society. This social contract is a different contract than a legal contract and has a lot to do with the blessings that your community gives you to use the land. These can help to smooth disagreements and build the trust that you need to continue trading well into the future.

The above constitute the key themes that you need to engage with in enterprise development. We now turn to the waste exchanges that are a key part of this enterprise. All these need to be approached as experiments and pilot projects and give yourself time to reflect and amend these arrangements until you find a working arrangement. Your most important experiment is your food-for-waste harvesting systems. You need to set these up as soon as possible. We now discuss these below.

Setting up food-for-waste exchanges

We can distinguish between different wastes, and each one has value. An urban farm can become a place where all these can be reclaimed and recycled, and you can do this at lower cost than reclaimers. There is already a well-developed sector of reclaimers in most of our townships, and the harvesting of waste brings them into the ambit of the urban farm. Reclaimers gain significant incomes and save municipalities lots of money in landfill costs. They recycle a large part of our plastics. Reclaimers frequent the *iZindaba Zokudla* and they are able to gain livelihoods by recycling waste, and this means that there is enough value in waste to start a farm. Take a look at the next chapter where I discuss ways to start urban farming by harvesting waste. Urban farmers can "go it alone" in harvesting recyclable waste, but it might be good to consider how a partnership with a reclaimer can work, even if you are "going alone".

Reclaimers will know the relative prices that recyclable waste can command in the open market. You have to engage with them in order to establish what would be the right price for recyclables that you can harvest from communities. It is important that these prices are set correctly at both parties' benefit. The prize that you are chasing is the low-cost harvesting of waste, and this may be more beneficial to both of you if customers bring this waste to the farm, as the high cost of searching through rubbish is avoided. Note that this "institution" of reclaiming waste will change as you engage with the reclaimer.

To establish what these prices should be, would need quite a bit of interacting and discussion between the reclaimer and the farmer. However, approach this on a trial-and-error basis and give yourselves a few weeks to establish how this scheme will work. If this does not benefit both, you would have to either find another solution or "go it alone". Studies of reclaimers have indicated they are able to command incomes that are above the median in South Africa, and the sector has a few development programmes in place. They are reforming

the buy-back centres that structure this sector in the economy. Now is the time to engage with these processes.

Sorting recyclable plastics

Reclaimers hold a lot of knowledge about the sorting and value of recyclables. Plastics, especially, are manufactured in many different kinds, and each receives a different price on the open market. By simply sorting plastics and other recyclables, a higher price can be commanded. It is important to separate these plastics at source, either at your farm or by your customer, and this can increase its value. In fact, all recyclable materials need to be sorted into their different types, and this is very important even for metals.

The kinds of plastics that can be recycled include the following:

1. PET – Polyethylene terephthalate. Soft drink bottles, oil bottles and meal trays.
2. HDPET – High-density polyethylene terephthalate. Plastic milk bottles, washing-up liquid bottles.
3. PVC – Polyvinyl chloride. Plastic pipes, outdoor furniture, bottled water bottles and shrink wrap.
4. LDPE – Low-density polyethylene: Plastic bags.
5. PP – Polypropylene: Bottle caps, margarine tubs.
6. PS – Polystyrene: Foam trays, plastic tableware, vending cups, packaging.
7. Other: Any other recyclable plastic.

Note that recyclable plastics have to have a mark on it that indicates what kind it is. These are indicated by numbers and this may facilitate the handling of plastic wastes. This needs to be brought to the attention of your harvesters – the customers – as this is a way for them to increase the value that they gain from harvesting waste.

There are some plastics that are not recyclable, and you may likely receive quite a bit of this. These would have to be discarded in the normal waste management system. To make this harvesting scheme effective, you need to develop an education programme with your community and include in

the information on how to sort all recyclable materials. You will need to decide whether your customers will sort these recyclables, or if you will sort them on the farm. It may be better that you do it and form a partnership with a reclaimer to make this effective.

To educate the community you would most likely need a reclaimer to be involved, as they hold the knowledge that the community needs to know, to effectively supply you with recyclables. This means that a secondary enterprise will be located on your farm, and this will also create value on site. What may happen is that some people will almost exclusively supply you with such recyclables and it is with such persons that a partnership can be formed. There will be a lot of labour and time involved in setting up such a system, and it may be best to form a partnership so that you as the farmer can concentrate on growing food.

Recycling metals

Metals are a little bit less complicated, and the major categories include aluminium and steel (which includes almost all metals other than aluminium). Hence, a metal recycling system is much easier to set up, but you would have to consult your reclaimer. This information also needs to be brought to the information and education sessions that you hold with your community. By making it known to them what metals they can exchange for food, you will create a supply chain that will bring these materials to your farm. Your reclaimer partner can lead this discussion!

Once again, you need to ascertain the prices that these recyclables can command on the open market. You have to exchange them for less than you can get on the open market and, hence, a discussion and interaction with the reclaimer is important. Then you need to establish the price that you will give for the recyclable materials, and make sure that this does benefit you. However, you may also want to enter an interaction with the customer, to ensure that they also benefit. This is a complicated affair, and I recommend that you discuss all these in a community event that you hold at your farm. In such an

event you can establish a process that all the stakeholders to this endeavour will follow and I discuss that below.

High-value biowaste

Some biowastes have high value and it will pay to collect these. Biowastes can always be composted ("dust to dust"), but this may take a long time. High-value biowastes include:

1. **Old cooking oil:** This can be processed to biodiesel and on the Internet, several tutorials and guides can be found on how to make it. Should sufficient high-value cooking oil be harvestable, a new enterprise can be created.
2. **Abattoir and butchery waste:** Butchers often pay others to discard their wastes. Bones are a very effective bottom layer of a deep trench bed, and are full of calcium and also some nitrogen. This is super valuable, and farmers need to make dedicated arrangements with butchers and abattoirs to collect and use this waste.
3. **Bulk food waste:** At the fresh produce markets and other places – especially from large commercial farmers, and also from supermarkets and wholesalers, biological waste is often generated. A good farmer will have arrangements with such entities to receive and use this waste in deep trench beds and in composting systems. At times, you would be able to find bulk quantities of waste, and this is a real source of nutrients for your soil.
4. **Animal waste:** Kraal manure is gold for an urban farmer. Many cattle farmers do not see value in *kraalmis* or manure and approach them about receiving this waste. This waste can be exchanged for food, and I am sure that a beneficial relationship can be found. Such a farmer will be interested in receiving the third-grade produce that is unfit for human consumption to feed to their animals, and here, an exchange relationship can be built.
5. I have also noticed that at some places it is possible to obtain bird droppings. Doves congregate at certain places, as do Hadeda ibises (*Bostrychia hagedash)*, and their droppings can be harvested. This would be a daily task to find the tall

buildings or trees where they congregate and harvest their droppings every morning.

6. **Human Waste:** Composting toilets are available and there are some good examples to see at the Siyakhana Garden in Bezuidenhout Valley. These may be costly, but some are certified that they can safely compost human waste. This may be a solution for some who are able to invest in this. However, this kind of solution should also involve the state. Until there is a clear technology on offer, and an accompanying policy, this is a distant dream, but some may be able to realise it. Should you embark on this course of action, do your homework, but remember, this is possible and will emerge at a higher level in policy discussions soon. When this happens, urban farmers need to be ready, as this will immediately secure their viability in the urban area.
7. **Human urine** is a good source of nutrients as urine turns into urea, but this may take a long time (about 48 hours). Note that urine will start to break down immediately after passing and will break down quickly in the soil. Urine may contain pollutants – that is why we pass it, and you should be careful. Always use it only in conjunction with soil. If you mix urine with manure, the bacteria in the manure will start metabolising heavy metals and contaminants. The 'dust to dust' process will safely process the urine if you leave it for a week before selling. There are some farmers who exchange urine for food, and they can harvest quite a bit from customers. This is unusual, but note that these materials are all biological and if the urine is, say, added to compost, manure or soil, it would be safe to use, as it will break down quickly in a compost pile or in the soil.
8. **Keep an eye out for how rain washes away biowaste:** At certain corners and intersections of roads, often at the bottom of a hill, biomatter will accumulate. These may be contaminated by motor oil or other pollutants but often it is not, and this waste can be harvested.
9. **Approach the Parks department** to see if they can dump their grass and other clippings at your farm. Engage further with the state, as the Extended Public Works Programme can supply workers for your farm. In return, you can teach

people basics about farming, like composting. Note that these emergent farmers would, in all cases, be willing to buy seedlings etc. from you, and here, a very beneficial relationship can be established.

Food-for-food waste: set the prices

Food-for-food waste is a way to increase your penetration into your markets and generate the inputs that you need to sustain your farm. Remember, if you do not institute such programmes you are competing (on a non-level) playing field with others who sell foods, as you would need to source these inputs from somewhere.

The way that you price the food or biowaste is important. A R5 cost for 25 litres of waste translates as follows:

The 25 litres will reduce to 7 litres of compost after processing. A 7-litre volume of compost weighs about 5kg depending on moisture content. 30dm square compost bag on the market equals to 30 litres in volume, and weighs about 18kg. It retails for between R30 and R40 on the open market. This translates to R1.66 per kg. R5 for 25 litres of fresh waste is more or less R1 a kg of finished compost, just a bit less than a store-bought bag. This exchange price is thus comparable and, hence, you are not exchanging at a loss.

The above prices are a benchmark, and you can use this to guide your decisions as you enter into negotiation with customers and reclaimers on the price that you will pay for food waste. I would recommend not to give more than R5 for the food waste, but you would have to establish this price by negotiating with your community. This can be best done in a community event at your farm, and I will discuss this below. Note that the saving lies not in the price of the waste, but in eliminating the opportunity cost of finding and buying the waste.

Food waste composting

Once you are harvesting food waste, you need to safely process it. The best way to process such waste would be to do so in a container that keeps pests like rats out but allows insects and

smaller creatures to enter the composting area. A compost cage can easily be constructed by an inexperienced welder. You can also drill holes in a rubbish bin lid. Remember, the food that is being composted does not really know where it is, and keep in mind that everything will turn into compost after some time. Should you not have a compost cage, you can simply build a neat pile – or a cage with old pallets, neatly in a square, until you can get such a cage.

Another solution is to soak food waste in water until it is rancid and then removing it and then mixing with leaves etc. as part of composting it. Rats will not eat rancid and rotten food. I use my municipal skip to do so, and I mix this food waste with cardboard and leaves to grow my compost pile. You will soon realise what kind of biowaste you can process, and over time, the same wastes will be used in your composting. Note what you get and adapt your composting to what you are processing.

The safe composting of food waste will create a clear image of your farm. The acceptability of this will make a big inroad into convincing your customers that your food is their preferred choice. Please note that Pick `n Pay has started with such a system to compost their own food waste, and they give this to one of their suppliers, a piggery. This kind of process will soon become mainstream, and an urban farmer is in fact positioned much better than anyone else to set up such a system.

Your food waste system does not have to include a compost cage. However, you need a strategy to deal with this waste, and this is a key opportunity that you need to address in setting up your business. My own strategy in dealing with food waste is a three-step process.

1. I first of all soak the food waste, with leaves, cardboard and cartons, in my wheelie-bin which is full of water. I add milk regularly to stimulate *Lactobacillus* bacteria in this mix and to ensure that *Lactobacillus* bacteria dominate my composting. This is the source of the bacteria and, hence, I add a lot of milk to condition the downstream processes. These materials will immediately turn rancid in the water. The cardboard bulks up the water and is a source of carbon.

Cardboard, newspaper or paper in general is always added to the wheelie-bin as this is hard to compost. It is not very nutritious, and worms will eat it, but they prefer what we ourselves eat. However, the food waste enriches the waste with nitrogen and prepares the cardboard and other waste for the composting bin.

2. The composting bin is a two-stage bin. It is made up of two rubbish bins, with one suspended above the other, and holes drilled into the top bin. Waste from the wheelie-bin is added to the top rubbish bin, and I also add leaves and other biomatter (as I have a lot). This is similar to a wormery, and this produces lots of worms. The cardboard and food waste are by this time starting to decompose rapidly. The top bin has holes, and some compost falls to the bottom bin, but every two weeks or so, I empty the top bin into the bottom bin, and it would take about three months for the bottom bin to be full. By the time the bottom bin is full, the compost is ready and is highly fertile. This is, however, very concentrated, and to maximise the value of this, I will mix it once again with biomass (lots of leaves) in the next stage.
3. I add the compost from the bottom bin to my open-air compost heap, made mostly from leaves. Because most of my compost is made of the same leaves of London Plane trees that grow in my road, I am expecting it to be low in nutrition and possibly acidic. Adding the bottom bin compost to this pile enriches it and gives the opportunity to build it even bigger with new leaves. The nitrogen from the bins stimulates bacteria and fungi and this processes the compost faster. I leave this for two weeks and by then the whole pile is close to being very mature. I keep this pile covered with see-through plastic to speed up the process as this warms the pile and keeps moisture in.

What I did here is to build several interlinking cycles of nutrient use in this composting process. These *Nxazonke* build value in each cycle. In building such a system, I am able to add unprocessed – dry – leaves to each cycle and this mix increases the volumes and speeds up the process and builds on

the nitrogen from the food waste. In this way, a pretty good compost can be made.

However, from this example a few lessons can be learned. We will mostly use the same material for compost, as this would be the most prevalent source in your area. This bulk material will most probably be leaves and sticks and these are rich in carbon, but you need nitrogen in the mix. Hence, the food waste will supplement the carbon, and you should aim for a carbon: nitrogen ratio of 7:1 in your compost. Of course, it will be difficult to ascertain this without expensive analysis, but keep in mind that you need quite a bit of nitrogen in your compost to complement the inevitable high quantities of carbon in the leaves and wood that you will be composting.

Reflecting on waste for food harvesting

With the wastes that you gather, note the following:

- Plastic: there are many kinds, and it would be best to partner with a reclaimer in setting up this facility. Separating the different kinds increases their value.
- Paper: Paper goes to composting. Brown cardboard cannot be recycled much more and note that every time that we recycle something, its quality declines. Things can be down-cycled, and some other things can be up-cycled. Brown cardboard is at the end of its life, and it may have more value if fed to worms or composted than if sold.
- White A4 paper, if sorted together, is very much recyclable, and you may get more value for A4 white paper if sold as recyclable material than composted.
- Metal: Metals are infinitely recyclable and can immediately be sold on. Check the metal for useful pieces, like pipes, as you may want to use them in your technology designs.
- Glass: Glass is infinitely recyclable, and this can immediately be sold on. Separate the glass into colours as they are sold on according to colour.
- Biowaste: Certain kinds of biowaste are very valuable on their own. Old cooking oil can be converted to biodiesel (there are several individuals on YouTube who readily convert old cooking oil to biodiesel and use it to fuel expensive cars). If you are able to collect this and keep it separate in a container, you may be able to sell this on. Many people do produce such old cooking oil, *spaza* shops and caterers, and this could be an important revenue stream. There may be other valuable biological wastes that you could access and look around for them. Even if you are able to only gather fresh green grass clippings, you could use that to start a liquid manure business on your farm.
- Batteries: Batteries are an important and high-value form of waste. Batteries are mostly metal and many metal recyclers will accept batteries. If you can collect and keep batteries separate, you may find a buyer if you can collect in bulk. The same could go for old cell phones and electrical

appliances. These contain rare metals and have a high price on the recyclables market.

- Old electrical appliances. Think about setting up your farm as depot where people can bring old appliances for exchange or repair. Partner with someone who can repair these and give them a little space in your shop. Now you are offering an additional service at the farm, and this will attract people. These people can become new customers. Now your farm is a community centre!
- Abundant biowaste: You will gather a lot of food waste through the exchange programme. Note that you need to find and process a very large amount of biowaste if you want your farm to be sustainable. You need to find a source of abundance. Biological waste is your future earnings. Look around and see if you can secure a source of biowaste. Your city's parks and recreation department may be able to give you all their biowaste. A nearby cattle farmer may be able to give or sell to you their kraal manure. You want to be able to source waste from a factory that, say, produces fruit juice. They may have a lot of biowaste that they pay to get rid of. Restaurants always have food waste – we call it swirl – and this can be used to feed pigs or chickens. If you secure such a source of biowaste, and you have the systems to process it, you will be doing very well.

Conclusion

This chapter details the interesting and "strategic tactics" that an urban farmer can follow to build their urban agricultural enterprise. Only a few of these suggestions have been tested in real-life, and some may or may not work. Success cannot be fixed on a set of recommendations, and you have to adapt everything to your farm. These have to be tried in real life and adjusted as we go along. In the next chapter, we discuss ways in which a farmer can establish a formal business; how this should be done, and the benefits of doing so.

Chapter Five

Starting the urban agriculture enterprise

The most difficult part of enterprise development is starting out. This is a real dilemma. Most new farmers do not have the capital to make good investments on their farms, and often, the produce is eaten and not sold, taking away the opportunity to establish an enterprise.

This is the hardest part of urban agriculture, and any attempt at starting a new business. Many may not have the means to establish an enterprise. Here, we will explore 'zero-budget' ways to start an urban farm. This would be mindful of the things discussed in the previous two chapters. This is an intriguing proposition, as we are aiming to upend the way that enterprises are built currently. The emphasis here is on starting small, making small incremental improvements, and on building and conserving value that can be later exchanged for money. It is in building value that we can succeed in starting a new enterprise.

In this chapter, I make a few suggestions for new urban farmers. The ideas here can help established farmers to develop a new enterprise, product or service. In all these cases, a 'zero-budget' approach needs to be followed, as this reinforces the steep profit profile that you are chasing for your enterprise. We will try to figure out in this chapter how an emergent entrepreneur can start to establish an urban agricultural enterprise with almost no funds.

I am not an urban farmer, and I can only use the academic and theoretical resources at my disposal to assist those who aim to establish a new urban agriculture enterprise. However, the insights from academia are valuable. These insights point away

from an enterprise development strategy based on a "big bang" launch where all systems and processes are in place. We should avoid mobilising debts, as the enterprise is small, and any debt will negatively affect the profit profile of the enterprise. We need to find a way to start with "zero budget"!

The reality is that enterprise development is a messy affair full of failures and new attempts. You should allow yourself to fail and make mistakes in selling, buying, producing, technology development and engagement. You should take one step forwards, and two back, until you have figured out how to produce, sell and engage profitably in your local area. Once you know what works, you can make a significant investment. However, the path to money is not through big events and big sales. In this enterprise you are trying to make a million rand by saving one rand a million times! The path of enterprise development is iterative, with small steps forwards, and deep meaningful reflection on what worked and what did not. Note the saying here: "If you do not have money to move forwards, find someone to engage in a partnership". This is important in the latter stages of your enterprise. Once you have established a customer base, you can engage in valuable activities like selling staples alongside your own produce. However, today we focus on how to establish the trade that will eventually become the urban agricultural enterprise.

Engaging with state policy and programmes

As a small-scale farmer, you occupy a privileged political position. State programmes in South Africa have a clear emphasis on small-scale farmers and this is politically motivated. However, policy in its entirety is contradictory, and there is a clash between how the state promotes small-scale farmers and how it promotes large-scale commercial farmers. Large-scale commercial farmers can afford the expensive inputs for modern commercial agriculture, and the technologies, from seeds to mechanisation to pesticides to irrigation are developed with a large-scale farmer in mind.

A key risk in dealing with small enterprise development programmes is that the approach underlying them could be

appropriate to large commercial operations, and not small farms. The state has a vested interest in promoting smallholder participation in global food trade, but may aim to build smaller enterprises into large ones.

The approach in this book wants to identify both an alternative to this and establish a more appropriate alternative path to market for smallholders. We advocate for a low-cost, low-input and capex (capital expenditure) approach to enterprise development. This is why it is necessary to sell yourself, as you will earn very little selling to middlemen who have to take their own cut.

It is important to understand what happens in the global food trade to understand why a large-scale approach is not feasible for a small-scale farmer. First of all, a large-scale approach neglects the savings that any enterprise would have to make to improve productivity on the space available. Commercial agriculture conducts things in "largeness" and such small savings are outside of its view. Hence, we lose the opportunity to build more efficient systems that conserve and repurpose waste as a farming input.

Secondly, farming on a small scale will set you up to successfully farm a larger landholding one day. As mentioned, all enterprises must seek efficiencies, and a small-scale farm is the best place to learn to make this work. Should you be able to successfully farm at this scale, larger landholdings will be much easier. However, note that a large landholding will be far away from urban areas, and in this case, you may have to engage with wholesalers. It might be a much better business proposition to stay on a small scale and innovate in this small enterprise.

Small enterprises need to diversify their product offerings to make it work. A third reason to engage in small-scale farming is because the means to diversity and to develop processing technology, services and products is much easier on a small scale. Markets are also retail markets, and this ensures higher revenue albeit at higher organisational costs. If you will be selling only crops, you might find it harder to achieve a livelihood than if you sell crops as well as seedlings, liquid manures and animal products like meat. Harvesting waste and

producing with it may only enable a singular livelihood, and the enterprise must significantly diversify to achieve some kind of profitability. Experimenting at this scale is much less risky than trying to set up an enterprise with one "big bang". The creation of multiple revenue streams, say from growing feed hydroponically, for your own animals and for sale, is one example. This creates value and reduces inputs. Designing your wormery to also capture liquid manures, and blending this liquid with urine and chicken manure, and selling it at high price, may be the only way to make a living from urban agriculture.

Hence, the path to profitability on a small piece of land depends on you being able to multiply the value of a singular process of resource use. For instance, hydroponic feeds can be used for animals. The manure that results from this needs to be processed. Flies will lay eggs in the manure, and chickens will find them and feed on this. The processed load of manure can

be given to earthworms, and the liquid can be extracted from this process, and blended with manure to make a liquid manure for sale. The casings can be added to the soil for vegetables. This will thus enable vegetable production at almost no cost, whilst chickens are already produced and fed.

It is by constructing these *Nxazonke* that profitability can be achieved. It is by moving materials – manure – from one cycle to the next that value is created. The overall design of these processes is easier at small scale – and possibly more effective, as you can intervene easily. This heuristic of interacting cycles of resource use must guide your planning, design and research, and we discuss this in here, and in a latter one where we consider sources of knowledge for urban agriculture.

Where do you want to be in five years from now?

How your enterprise develops depends on how it interacts with those around it, from other businesses to customers and stakeholders. However, develop a mission and vision for your farm, and base this on the unique value proposition that urban agriculture can realise. This UVP is not only your vision and mission, but also the framework which you will use to guide you in setting up your enterprise. Think of what your enterprise could look like in five years' time. Create a vision of what you can achieve and think big! Once you have this vision in mind, work "backwards" from this vision, and develop detailed action plans (tactics) that will realise this vision step-by-step.

When you develop this vision, note what we discussed in previous chapters. You would want to include a "permaculture" design as part of this vision. Spend time in developing this design, and make sure that you design for water harvesting and orientation to the north. Design the layout of infrastructure (even if you can only build it later on) and design for the movement of materials across the site. Build this vision as a picture, drawing or sketch, or text (or both), and add to it as you go along. This vision can direct your own enterprise development strategies and tactics, and keep it close to you, and adapt it regularly.

When you do set up this enterprise, you will have to engage with many others. This interactive engagement creates space for you to experiment and try new ways of producing and selling. Use this to-and-fro of engagement with others to develop prices, selling strategies, engagement means, communications, and your own systems. Keep your five-year vision in mind, as you will use this to-and-fro interaction to realise this vision.

The most difficult activity is to start the enterprise by producing, trading, engaging and implementing technology, and all this has to be done more or less at the same time to establish the enterprise. How can someone go about doing this from nothing?

Understand what you are aiming for: a small enterprise with a steep profit structure and almost zero input costs. Such an enterprise will have the following

- Transactions will include both cash and barter or exchange: How do we establish a structure for such transactions? This can be done once customers understand how you are selling and producing. This calls for community education, but also some infrastructure. Where will you sell? What do you need to sell professionally?
- Waste has to be harvested to ensure low input costs: how do we establish a waste exchange mechanism? What are the things that you need to do to realise this? You would have to educate customers about this exchange mechanism, and they will have to see lower prices to support this. This needs education and infrastructure and find a way to set this up. Make sure that the exchange takes place at the same moment that a sale is made, to reinforce the connection between sales and waste harvesting. Now the customer will immediately see what value waste brings, and immediately the connection will be made!
- The waste exchange mechanism has to feed into the input manufacture and production systems for crops. In this regard, your waste processing systems, both for composting and for recyclables need to be presented to the community, and it has to integrate with production and sales. Make

sure, by looking at the costs of compost on the open market, and make sure that the price for the exchange is lower than the costs that you will incur to buy this compost on the open market.

- A dedicated sales strategy: From lower prices to discounts on waste, to selling staples and through to loyalty programmes. You need a shop, or a sign indicating that you are selling. You also need basic equipment to sell. You need to develop these products and services (a waste exchange service). Here, you would need both community education, partnerships with bakkie traders, and also clear products and services based on this waste exchange mechanism.
- A dedicated engagement process to market produce and educate customers. This can be implemented with social media and events on the farm.
- A means to stimulate the local circulation of capital and value. This points to regenerative and circular systems for the enterprise. The integration of waste and production does this, but additional means can be created. This relates to how the customer completes the processes of the enterprise. They bring waste and this is processed to inputs. This leads to lower prices and better human development of the customer. Remember this when you reflect on the impact of your enterprise.

As you can see, the vision and mission accompanying the UVP is quite comprehensive, and this can lead you in developing the enterprise. Once you have established a base for trading, the above-mentioned systems, and others, can be created by working "backwards" from the vision to current reality.

This is what your enterprise may look like eventually. However, this still leaves open the question of how to start if we have very little means.

Before you start: preparation

Your first steps must always be undertaken very carefully, and you need to keep your risks low to succeed. Think of failure and what you will do if you "fail". All you can do is reflect and

learn on what you have done and try again. When starting to trade, always engage with the customer. You need to find out how they feel about this particular transaction. Focus on what they want and enquire about their habits. For instance, if you are developing a product for "customers coming home from work", you could consider many things: you could have such customers on a database, and this can ensure that they receive their product every day at a designated time. Make sure that they understand the payment and pick-up for the product. You may even want to allow them to pay at the end of the month. You could also create a pre-payment system. Remember to integrate this with waste harvesting!

You can learn a lot by talking to a potential or actual customer and use the conversation to find out exactly why your products were not sold, or why they were indeed sold. Engage with them, as there may be a particular way that they would like to receive their produce, and you can be very imaginative in selling it to them. Customers will appreciate this attention, and this is the beginnings of a marketing strategy.

When you think of your enterprise, think of how you can sustain low prices. This can only be achieved in one way: Somewhere in your own supply chains you need inputs to be available at below-market prices. The practice of selling competitively depends on sustaining a below-market price for an input throughout the whole value chain, so that it translates to a below-market price for a product. The importance of below-market prices, both for produce and inputs into the enterprise is supremely important.

Business competitiveness is nothing but sustaining below-market prices in the enterprise. How to sustain a below-market price for goods and inputs? This can be achieved by the waste exchange mechanism, and the savings from this input must be sustained right through to the final price of the produce. The value of the biological waste for your production needs to be more than the discount that you give. This is hard to determine, as your production system is without cash, and it is difficult to see how much it would cost you to produce. However, this can be determined in interaction with a reclaimer and passing this information to the customer, so that we can arrive at the right price for waste. Also look out for prices on the open market, and adjust your offering based on this. This must benefit the farmer, the customer, and the reclaimer. This can only be achieved with a long process of interaction where we compare and evaluate prices over time. This would need some adjustment to take place, but this may just enable you to find the sweet spot amongst these competing interests for the right price for waste exchange and sales.

Starting the business

Start with planning: planning will enable you to make investments on the farm, mainly to acquire the materials needed for a deep trench bed. You should accumulate the materials for a deep trench bed all the time, but you should plan to build your trenches with all materials available when you do. This could take time and effort, but the local environment must be scoured for inputs, and you should be familiar with what is available in your area.

The planning, however, should focus on the immediate problem: how to mobilise capital and value to engage in investments on the farm so that trade and production can commence? Your investments will be in labour: training workers, preparing the ground for planting and investing in a deep trench bed and other technology.

To commence with the enterprise, you need a source of value. You also need land, so, first find land and see if you can secure a lease for this land. Value can be found in the form of lots of waste (see the planning above), but this may have to be converted to cash. As reclaimers are able to do this, you could simply aim to collect a lot of waste and sell this as cash as a first input in the enterprise.

Below, I describe ways in which you can start the farm. Mix these recommendations so that they work for you. In all cases, a unique approach must be found, and this depends on the wastes and labour that is available to you. Adapt the approaches to what you have available. You have to be imaginative in how you mix these recommendations, so that they work for your farm and your site.

Option no 1: Investing in seeds and seedlings

One way to mobilise enough value to start an urban agricultural enterprise is to invest in seeds, and lots of them. In your planning you should have noted the proliferation of spinach, *Brassica* species, like Chomolia or Muchaina seeds (*Brassica* rapa, or Chinese mustard cabbage – rape), amongst others, at the end of the winter season. Make a point to harvest very large quantities of seeds, in anticipation of starting a farm next season. Acquiring lots of seeds, and there are many ways that this can be done, sets you up to produce a lot of value that can be exchanged. This is the value that you need to start the enterprise.

Sprouting lots of seeds thus opens up two possibilities:

1. To sell seedlings (a lot). To do this you may have to invest in seedling trays, or you could use newspapers and compost to make seedling punnets. These are sold for cash to mobilise enough money to invest in deep trenches for the next season; and/or,
2. To plant large quantities of easy-to-grow crops, like spinach, *Chomolia* and *Muchaina,* or grains, like sorghum and maize, with beans and pumpkins. If you have lots of seeds from other plants, use them! Plant in unimproved soils to save labour costs, and hope for rain and for a sufficient crop from this. You will be hoping for rain, and this is done in absence of the ability to build a deep trench. This is to gather enough value to build the trench in a next round of development. Do not invest a lot of time or effort in this planting, as you would rather plant more plants on more land than planting a few in a fertile deep trench bed. Here, you are focusing more on volume than on effort, and the

idea is to sell this to mobilise capital to sustain you so that you can invest in deep trenches. See option no. 2 below!

Selling seedlings to other farmers is very important. This creates a system of mutual exchange amongst farmers. If you grew a lot of seedlings, and are selling them to mobilise capital, note that those who buy these seedlings will be looking for additional products to use to grow the seedlings. Compost, worms, liquid manure and other technologies can now be sold or exchanged with these farmers. This will create a system of mutual interaction, and you could be the apex farmer who supplies seedlings to others who then sell food to the community. Such a group will be in the market for sophisticated products like liquid manure. Such complex systems are very resilient. Having someone regularly supplying seedlings and fertilisers will stimulate additional farmers. This will create a system that is robust, and multiple farmers will be producing, and they will be supported by secondary activities like seedling and fertiliser production. To be viable, you may decide to only grow seedlings in your enterprise!

Option no. 2: Plant lots of crops on 90% of the land and invest in a deep trench on 10% of the land

Another strategy that can build on the above is to use 90% of the land to grow a lot of low-input rain-fed crops, as described above. The 10% left out, will be subject to significant investment in the form of a deep trench bed. You will also start with lots of seeds, either bought or harvested. You will grow a lot of seedlings and plant as many of them on 90% of your land, and sequence this with the rainy season. The idea is to spend as little effort as possible on the 90% of land, hope for a good crop, and aim to sell these rain-fed crops. This is the capital needed to invest in the deep trench.

As you sell the rain-fed crops, you are creating space and cash for yourself to invest in the deep trenches on the 10% of land that you have. The sales of these rain-fed crops must sustain your gathering of inputs for the current and next deep trench and the technology that will accompany it. This

is a multi-year strategy that depends on the harvesting and planting of lots of seeds and seedlings as a short-term measure and investment in a deep trench as a long-term measure.

In subsequent years, you need to expand the 10% used for deep trenches, so you create more of them, which are more fertile and will multiply your own efforts on the ground. However, as you move forward, you could find ways to stimulate the rain-fed crops, which you will be planting for the next few years until you have enough deep trenches to focus only on those. Here, you could use compost extracts and liquid manures and also consider irrigation or even chemical fertilisers. The point is to gain a profit from the low-input rain-fed crops so that you can invest in deep trenches and additional technologies that bring higher returns. These higher returns enable the creation of an enterprise.

Option no. 3: Recycling and waste accumulation

From the above, it is clear that the way to start the enterprise is to accumulate lots of value before you farm. As you will be harvesting wastes as inputs for farming, you may decide to either accumulate enough to start a farm, or you could decide to focus only on waste processing and include compost and liquid manure production in this enterprise.

One way to do this is to gain exclusive rights to people's waste. You will then sort and separate the different wastes of a household, and sell this on to reclaimers, or buy-back centres, and sell on organic waste to farmers, or use it yourself. You will be linking reclaiming with farming.

This approach will enable you to accumulate enough biomass to start a deep trench bed. You could at this point elect to focus on a wormery, liquid manure production and compost production. This may make available enough for a livelihood provided that you have access to sufficient households. In this way, you can accumulate enough resources to start a farm, and you can then use one of the options above.

Building the enterprise further

It is important to build the base of the urban agricultural enterprise described above, so that this creates enough value to invest in the future productivity of your farm. This base will need you to engage in sales, and you should thus start setting up the systems of the enterprise as soon as you are starting to sell. The first transaction may not include waste exchange, but encourage this. The price of this first transaction will be important. Make it low so that the process starts! You will quickly see how this transaction works. The food sold needs to be balanced with the harvesting of inputs and focus on harvesting as much waste as possible in the beginning, so that you are safe. Establish this in the minds of the first customers, until you are ready to host a community event where you can present this system to the customers and find the right price for this exchange.

Use the event to then also establish a system of recyclables harvesting, and for this you really only need a big box to place the cans and other recyclables in. People's understanding of how this works is the gold standard. If they understand, then you have set up this system. Note that the key here is to separate at source, so it is ready to sell, and do not incur additional costs after harvesting.

Once you have established a tradition of hosting community events, you can also start setting up an engagement

system with SMS or WhatsApp. This then immediately becomes a loyalty programme and database of customers.

Start processing waste into products: Build compost cages either with metal or with old pallets, and make that sure it looks good. Build a wormery, not only for processing waste and creating liquid manure, but also as an educational installation so that people see what happens with their food waste once they exchange it. You can also start making a liquid manure, and this can be sold firstly to those who bought your seedlings. You thus may want to invest in two rabbits or two chickens at this stage. In all your activities, you should be mindful that you are not only selling but creating the market wherein you operate. The more information that you give to customers, the more layers of farmers and suppliers, the more activity there is, the more dynamic the market will be, and with this, the potential for higher returns.

The future of the enterprise

It is important to always plan ahead and think of the future. Any enterprise is a *lappieskombers* or *Bricolage* of activities, systems, people and things. Keep it like this, as this is flexible and allows you to change things. Be flexible in the way in which you interact, as a flexible organisation can respond better to new opportunities.

Think of the future when you set up your enterprise. The future systems need to be birthed early in the game: Set up waste exchange, set up community events, set up selling strategies, set up your investments, particularly in deep trenches and irrigation. Invest in a record-keeping system, as you can learn a lot from records. However, to guarantee your future enterprise, it may be better to focus on your ability to change society and people's behaviour than your ability to control things. We do not know what the future holds, but it will certainly be different.

Chapter Six

Registering the business, compliance and finance

The registration of a business is a really important issue to attend to for any entrepreneur. It is necessary to register a business, and it is important to understand what goes on in the background to this registration. Accompanying registration are many other issues, from compliance, to tax, to finances. In this chapter, I will set out how to go about thinking about and registering a business. I will also detail what is necessary to register and what the "compliance" universe for an urban farmer looks like. There are many things to attend to in this regard, and in this chapter, I set out some answers.

What happens when we register a business?

Registering a business is part of a more complicated contractual arrangement between the entrepreneur and society. Society allows us to do business, and gives us certain advantages, but also needs something in return in order to give the entrepreneur some advantage and protection as an entrepreneur.

This is part of the larger social contract between society and citizens. When a company is registered, we create a safe space for the business to operate in society. When we register businesses, we register them as "limited liability" entities and organisations. This is to protect the entrepreneur and to give the entrepreneur space to operate the business. This limited liability is a real thing. It means that the entrepreneur and the company are liable to pay damages that come about through the workings of the business, only to the value of the business itself. There is, thus, a limit to damages that anyone can claim from an entrepreneur, and this is the protection that an entrepreneur

needs to take risks and start a new venture. Think of it as being married "out of community of property" with your business.

Let's say that you sell food, and someone becomes really sick from consuming your food. They may sue you for damages caused by the sickness. Say that this person was a billionaire and because of sickness missed an opportunity to build another billion-dollar business. You are liable for these damages that the billionaire suffered. However, if you are registered as a company, your liability is "limited" to the value of your business. Say your *chesa-nyama* was worth only R10 (what someone would pay for the business). This R10 is thus the limit of your liability, and the billionaire can only sue you for the value of the business, which is R10. Registering a business triggers this kind of protection for the business owner.

If the business was not registered, it becomes, almost by default, a personal liability company, and the liabilities of this company are unlimited, because of not being registered or being formed only as a "sole trader". In this case, you will be liable for the billions that the billionaire lost, but would most probably be found insolvent, as the business, and you yourself, are not worth as much as the billionaire lost.

As you can see, there are benefits to registering a business. However, to register and enjoy the protection of the state as a limited liability company, you have to subject yourself to governance by the state and society. We, as society, simply cannot let you go and trade with limited liability and not receive any benefits in return.

To be registered, and enjoy protection, we, as society, need to know that you are conducting business in an honest and accountable way. We need to know that you are following laws, that you protect your customers, and that you are paying taxes. To ensure that companies do behave like good citizens, we thus subject them to regulation. Each company needs to have their finances audited by an independent auditor. You have to pay for this service, and it is unallowed for an auditor to do this for free. This is to ensure that no "favours" or conflicts of interest enter the space where the company operates. You will pay for the auditing according to how much money you have generated.

Auditing is the cornerstone of how we regulate companies. Auditors look at more than mere finances and will ask questions on B-BBEE (Broad-Based Black Economic Empowerment) status, on how you deal with thefts in your company, how you deal with laws and compliance, and they have the opportunity to express an opinion on your business. They can help you but note how important it is for your own integrity and reputation that you have an INDEPENDENT auditor. You do not need to do much to be audited. The most important thing is to keep a record of all income and expenditure and the auditor can complete your books if they have full access to your records. It will be simple to do so, and it is important, also for yourself, to keep records.

When should you register a business.

Businesses need to be registered, but you have to exercise judgement on when it is the best time to register your business. You should register your business only after you have traded already, and it is not a good idea to register first, before you have traded. Registration should come after you are trading, have clients and after you have paid your own personal income tax.

In all tax regimes there are minimum thresholds to cross before you need to register. You have to manage these thresholds and await the best time to register your business. Note also that there are different tax categories that you should keep in mind. You are firstly liable for personal income tax, and here there is also a threshold. Your company is also liable to pay tax when thresholds are crossed.

My personal opinion would be to start trading and to keep records. Start accumulating money and save it in the bank, but hold off on company registration until you have a large turnover, in the region of a few hundred thousand rand per year. When you start receiving an income, and if it is regular and large enough, register for personal income tax. At this stage, you and the business are probably losing money, as the business may not be paying you "enough". In a real sense, you are not liable for tax, as you are losing income to the business, which is

itself not yet solvent. You have invested your time and your own money in setting up the business, so in a sense, the business owes you money, and, thus, the business is not yet solvent. You are, thus, underpaid, as the business owes you money. No one needs to pay tax in such a scenario.

I would consider registering the business if the money that you receive from the business is sufficient to start paying personal income tax. At this stage, the business may only just be solvent, and turnovers may be very low. At this point, you should register for Turnover tax for the business, and try to keep the business afloat without any undue and large profits, as the business is probably still underpaying you. Turnover tax is an opportunity for emerging business to pay only 1% to 3% tax up to a turnover of R3 million. This is available in South Africa, but similar clauses may be found on other tax regimes.

When you are trading and you are earning sufficiently to trigger tax laws, register for turnover tax for your business. This is a way to enable small business to trade with no undue tax burdens, and this can help you up to the point where your business turns over up to R3 million per year. You will pay a reduced tax (3%) and R300,000.00 on top of this. This is a lot better than the flat rate of 28% that you will pay as a company.

Once you breach the threshold of R3 million per year, you can also pay a reduced tax as a small business corporation and you have to register for this and the reduced rate will apply. This is possible in South Africa, but many other tax regimes may also have a concessionary tax for small business.

It is necessary to strategise how to register a business. It should only be done when you clearly are earning enough money from the business, and tax should not unduly burden you. You should have at least six months of records and trade behind you before you register. You are, in fact, earning the funds for the nation, so be responsible but also mindful of your own interests in this regard.

With the above said, it is best to delay your registration until the moment is right. Selling good food produced in biological ways is a very low-risk activity, with a low likelihood of something calamitous taking place. However, it may be

possible for some urban farmers to earn in the region of R3 million per year, and this is important. Registering, paying tax, and receiving some protection from the state, will have deep effects on society. Establishing local food production and retail shops as legitimate businesses will place urban agriculture on the agenda as a viable and legitimate path for economic development. Urban agriculture is seen by many as a marginal activity that cannot be taken seriously. If urban farmers do not build proper enterprises, with services, products, and benefits for the community, it will always be seen as a marginal activity that is only survivalist.

It is possible that we can create new enterprises that combine production and retail, and these could expand much further. There are many middle-size smaller towns in the world where these ideas really come to fruition. The harvesting of waste and its incorporation into business processes will leave us with a new value and enterprise proposition. It is possible that a few farmers or retailers can expand these ideas further and construct large enterprises that serve specific communities.

By being compliant and by registering, we signal to the world that an urban farmer or retailer is a viable economic proposition and that this can lead to improvements in the food system.

What forms of enterprise are relevant to urban agriculture?

The form of the enterprise, firm or business is an important issue to think about. It is preferable to have limited liability in any business endeavour. However, the actual form of the business is only partially determined by its form, or category of registration. The intricacies of a business, particularly a partnership, is the intricacies of the contracts underlying the business.

Public and private companies will have contractually defined trade with their suppliers and clientele. These determine the actual processes in the business. As soon as you cross a threshold of size, you will become ‘defined’ in this way. However, this takes place in a registered business, and

leading companies are either private or publicly owned and traded businesses. Publicly traded companies are those that trade shares on a stock exchange, and they have to make their finances public, so that public investors can make the right decisions on buying shares or not. Private companies are private and do not have to disclose their financial statements, but are regulated. The interests of shareholders govern the company.

Urban agricultural enterprises are small, and have to make clear and good decisions on their registration, and the arrangements that will govern the company. The main choices would be between a private company, a cooperative, a partnership with others, a corporation for public benefit, or a non-profit organisation. We discuss these below.

Cooperatives

There are many agricultural cooperatives in existence out there in South Africa, and many prefer this enterprise form for agriculture, particularly for small farmers. A cooperative is defined as an: "autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly owned and

democratically-controlled enterprise" by the International Cooperative Alliance. This definition could apply to many kinds of activity, but the joint ownership is important. A cooperative should benefit from that which is owned communally, like a piece of land, and it should be the joint ownership, as opposed to linking together lots of individual ownerships, that should give it an advantage in the market.

For instance, if five persons own four sewing machines, the joint ownership can make the four sewing machines work like five (by structuring the use of the machines) and this should be evident in a cooperative. They thus beat the competition by having to buy only four machines instead of five.

Many cooperatives in South Africa do not own anything jointly, and often, when they do, the use of this joint property is done as if each had individual ownership of a part of this joint property. This is where disputes and disagreements emerge.

It may be better to form a partnership and not a cooperative and do so based on a joint memorandum of understanding. Partnerships do not have to be audited, and cooperatives have to, and this can incur savings. You would have to get a lawyer to draw up the memorandum of understanding or incorporation, to avoid disputes later on. However, the mere fact that you are a cooperative will not make you work harder, nor will it let your plants and animals grow faster. Owning four machines and using them as five will, however, put you ahead. Most cooperatives do not understand what they have in common, and how to use such a common property as if each had full access to it. Rules and regulations need to be established for the sustainable use of a resource by many. Cooperatives fail because there is no real cooperation, and often people are merely organised like a bunch of potatoes in a sack!

It may be important to note that the idea of a cooperative can be further specified. A 'production' cooperative will produce together and aggregate production. This will be sold together, but if the agreements between cooperative members are not right, it may be that those who make a large contribution to aggregate production may not be equitably rewarded, and the gains may be divided equally and not proportionally. All co-ops

would have to have these benefits very narrowly prescribed for them to function.

It is better to form a 'marketing' cooperative than a 'production' cooperative. They have to be structured in such a way that each co-op member benefits from communal ownerships, but you have to guard against some "free riding" on the efforts of others. This shows how complicated things could become, and most co-ops are not able to deal with and pre-empt such highly specific conflicts. This is why they fail, as the way that the arrangements are to be made need to reward the individuals, offer them incentives, but still protect the communal base from which all this activity comes.

A partnership may be a better idea. However, partnerships are only the second in the line of enterprise forms that you should be aware of.

A personal liability trader

When you trade, you establish yourself as a personal liability trader, or 'sole trader'. This is the most basic form of enterprise and can only be manually registered at the CIPC (Companies and Intellectual Property Commission). You would be liable for any eventuality in this scenario, as you do not enjoy limited liability, but note that selling unprocessed and fresh foods is not high risk.... However, everyone has to start here. The unbroken line of transactions that is your enterprise starts here.

Partnerships

When you trade with others, as "co-owners", you are engaging in a partnership. Partnerships are governed by contract, verbal or written. It is better to have written contracts and clear specifications of what is expected of each partner. Partnerships do not need to be registered at the CIPC, and they are not liable for company tax until they reach a certain threshold. This is a good way to avoid auditing fees, but each member is liable for personal income tax. A partnership is also subject to unlimited liability, and does not enjoy protection like a limited liability company.

Private companies

When you are serious about forming your own company, you would have to register as a private company. It is private in the sense that it belongs to you. You do not have to disclose your finances or anything about the business except to the auditor and the revenue service. You will pay the flat rate 28% company tax and have to also register for VAT, should you cross a threshold of income. Below, I set out what a company should do to be compliant, and you would have to follow all these prescripts. This company will be limited in its liabilities, and this is appropriate for the large-scale trade that it will do.

Public companies

If you want to seek investors on the stock market, you will form a stock exchange-registered publicly listed company. Because investments are sought from the ordinary public, and to protect the ordinary public who invests in these companies, these public companies have to make their finances and communications open to the public. This is to ensure that the public can make an informed choice about investing in these companies, and so society can see that they conduct their business honestly and with integrity. The price of these shares is thus public knowledge, and they can be traded immediately. These companies also enjoy limited liability.

Corporation for public benefit and non-profit organisations

South African law allows "NGO"-type registration of corporations. Under the Companies Act, you find a category called "Corporation for Public Benefit" and under the Department of Social Development you can register for a non-profit organisation (NPO). Both these organisations do not pay tax, and any surplus has to be either reinvested into the organisation or paid out as salaries. Both these organisations need to be audited. However, it is not correct to register here in order to avoid paying tax. This is not really intended for profit-seeking enterprises. Many, however, do use this, and present their enterprises as "for the public good". You should

note that, eventually, you would want to register for the right category of organisation, as you want to develop it into a professional organisation.

Other forms of economic organisation

Besides these forms of the "firm", we can also identify mutual societies and "clubs" as organisational forms that may be relevant to urban agriculture. A club will function like a partnership but would be structured by the membership contract or constitution. The law will force you to be consistent with your own constitution, and this is how we can regulate business, by insisting on the integrity of conduct.

A mutual society is very much like a cooperative, except that members do not contribute any capital or property to the society. They contribute through their custom, and what they buy. For instance, when you buy a life insurance policy from a mutual society, you become a part-owner of the society. This idea may help with a buying club, which is similar to a *stokvel*. This is governed by the contract between the members, and we thus say that it is governed through private law – the agreements that people make between themselves.

Being audited

Auditors perform a very important function, accounting for money, but they do so in a way that brings integrity and honesty to dealing with money. They have to be independent of the client, and they express an independent opinion. They will cost you money, and that is why it is important to approach them only when it is needed. You could do so when you are in a partnership, to bring integrity to the finances and the relationships between the partners. Note that as soon as you register an organisation, be it a private company or an NPO, the clock starts ticking on day one for your annual audit. Hence, only register once you have earned enough money to justify the auditor's fee, and the tax that you may be paying.

To engage the services of an auditor you need to keep records. Record-keeping will allow you to analyse your sales and activity at the farm, and please see the previous chapters

where we discuss how you should keep records so that you can analyse them.

The services of an auditor will propel your enterprise to a new level of integrity and compliance. However, sequence the services of an auditor with how you are planning the registration of your company. The decision to register, be audited and become compliant in all other aspects needs to be planned and worked towards. Also consider a bookkeeping service, and coordinate this with your audit, as this way may be slightly cheaper.

What must I do to register the business and be compliant?

There are more-or-less 12 steps to follow in registering a business and becoming compliant, according to my colleagues. However, this is a shifting target, and new forms of compliance may emerge at any moment. Compliance is broader than registration and there are many state departments that we need to answer to, to be compliant. It is simply not possible to do this as a one-stop shop, as you would have to assure many entities that you are capable of running the business properly. Engaging with our customers is one way to be compliant to their needs, and you are also governed by this engagement. Some of the things that you can do revolve around customer engagement and education. The Companies and Intellectual Property Commission in South Africa is only one entity that you need to satisfy, and there are very many regulations that you need to be mindful of. You have to note that there is a "universe" of compliance that you have to satisfy, and you would have to be mindful throughout the life of your enterprise to changes in this area.

The main aspects of registration and compliance include the following:

1. Your business needs a name. This name must be unique, and at the CIPC or authority, a search will be conducted to see if this name is unique. A name links with marketing and this name will have to inform your branding.

2. The type of enterprise is also important. You will only be engaged in registering at the CIPC if you want to form a cooperative, a private company, or a publicly listed company. A personal liability business and a partnership do not need to be registered as such at the CIPC, but a partnership needs a written or verbal contract to commence. To do this registration, you need to have an address and premises. You will also have to make available your identity number and many other documents in this regard, as you need to have the legal capacity (18 years or older) to register a business. When you do so, you will be asked for a **Memorandum of Incorporation** that sets out the enterprise form, officers of the enterprise, and many other aspects, like how you will make decisions and conduct meetings.
3. Should you be using proprietary technology, like patents, trademarks and designs, you have to declare this. Those who own this intellectual property need to be notified that you will be using it. In most cases, you will make such an arrangement when you acquire technology, and this really only applies to high technology that is protected in some way. When you do your own DIY technology, it is not necessary to declare this, as it is not protected by any entity nor belongs to any specific person.
4. If you make claims about products, like skin creams or herbal remedies, you have to have your claims verified. Many are in the business of manufacturing their own creams and cosmetics with herbs and plants, and the point is to only make a claim about this that has been tested and verified scientifically. This is to protect consumers. If you are making a cream or cosmetics, sell this without making any claims, and this would be acceptable practice. However, note that if anything happens to your customers through the use of these products, you may be liable. It is best to sell them with no claim and to make the customer understand that the product does not make any claims – even if you believe that it is useful. If you make such creams and ointments, ensure that you use only natural and benign ingredients.

- Testing of products is only one part of compliance. To tell people where your food comes from is included here. This refers to the traceability of your food and an urban farmer who produces and sells can combine these aspects. This is where you show the community and customers how you produce, by showing them your composting systems, your production systems and the farm or garden in general. People will know where their food comes from, and this is a key feature of your enterprise.
- Some have linked with certification schemes, and I recommend that you consider the Bryanston Organic Market's "Participatory Guarantee Scheme" for organic produce. This is producer-friendly and enables smaller producers to achieve an organic certification at low cost. The certification process will enable you to achieve organic production, and this is part of the UVP that you offer, and they will also supply you with a branded label. They will help you to achieve this certification. This increases the value of your produce, and this is very much worth considering.

5. Local authority trading licence (if applicable). If you sell food, you have to apply for a local authority trading licence. This may be a sufficient form of registration, if you also register for personal income tax and your business operates at volumes lower than tax thresholds. Obtaining such a licence will stand you in good stead in engaging with the local state. The kinds of enterprises that must have a Local Authority Trading Licence, for example, in Johannesburg, are listed below:
    - Food provision: You need a licence to sell or supply meals, take-aways or perishable foodstuff. When the local authority trading licences were designed, urban agriculture was not on the agenda, and they did not foresee these enterprises to emerge. However, as such a farm trades in food, it seems appropriate to adopt a local trading licence. Please speak to your local ward councillor about this. If you adopt the suggestions in this book, please note that you will be a food trader and you

would need a local authority trading licence. This is easy to obtain and mostly needs a payment and there should be no trouble with this. Note that once you have this, you are "FORMAL"!
   - Health and entertainment facilities;
   - Turkish baths, saunas and health baths;
   - Massage or infra-red treatments;
   - Male and female escorts;
   - Three or more slot machines and electronic games;
   - Three or more snooker or billiard tables;
   - Nightclubs and discotheques (where live or loud music is played);
   - Cinemas and theatres; and,
   - Adult premises.
6. The revenue service: Everyone and any entity that earns money needs to register for employee tax, company tax, Value Added Tax (should you cross certain thresholds), and owner's personal income tax. When you register your business at the South African Revenue Services, you have to also register employees as taxpayers. You may have to register to pay VAT, and you yourself have to pay personal income tax. Read this provision with the suggestions that I made above on how to register your business and plan the time and ways that you will register, as this will bring tax obligations. In most cases of UA enterprise development, you will only use temporary labour and you yourself may not earn enough to pay tax. However, it is important to know about this, as you may be asked one day by an inspector…
7. Unemployment Insurance Fund (UIF): South Africa has provision for unemployment insurance, and many other countries do so as well. You yourself and your workers are able to register for the Unemployment Insurance Fund or UIF. This is triggered when you pay them sufficient wages and if you employ people full-time. By paying a UIF contribution (that can be included in the wages of your workers), you can give them some form of protection from unemployment. Should you be a registered business, this can be made available to workers and note that this is a benefit that you give them, and this enhances the value that

they receive from your labour contract. Should you not have the funds for this, then you need to employ people only part-time.

8. South Africa provides for injury protection during employment, and many other countries do so as well. COIDA, The Compensation for Occupational Injuries and Diseases Act is a social security measure that protects workers from accidents whilst on duty. Once you are registered as a company, you need to register for this provision. Once you register, you receive a letter of good standing. When one of your workers suffers an injury, this protection will be triggered, and the worker will receive compensation and provision is also made for medical expenses like hospitalisation. Once again, this is a benefit that you extend to your workers and is a bonus in the labour contract.
9. Manufacturing enterprises: In South Africa, enterprises that manufacture must register at the Department of Trade and Industry as a manufacturer. This will bring about important benefits. Manufacturing is a key sector that enjoys priority in state policy, and there are several multi-stakeholder initiatives in place that can help you to build such a business. I am thinking of those that are able to manufacture technology for urban and other farmers.
10. Many opportunities for business incubation transpire in the manufacturing space, and many kinds of enterprise development are organised in a similar way. In these multi-stakeholder groupings, opportunities for funding, mentoring and coaching, and enterprise development opportunities are made available. Once you are reaching revenue that makes you eligible to register your enterprise, find a development programme that can assist you in building your business further. The suggestions made in these pages are different to how agricultural development agencies conceptualise development of new entrepreneurs. Make sure that these development programmes serve the ideas that you want to follow and let them support you instead of them leading you.

11. A compliance universe: Any business has to comply with the rules and legislation appropriate to them. You need to constantly keep an eye out for new developments and legislation that will affect your business. This also includes keeping an eye open for new innovation: technology, production systems, and techniques. To operate a business is not to be taken lightly, and you have to constantly endeavour to ensure that you are able to respond to any and all future challenges. Develop a system of information-gathering and analysis that will help you to stay abreast of new developments. This is a formalisation of your own enquiries into the world, and it helps to systematically keep an eye open for new information that may affect you and your business.
12. Labour relations: Contracts, labour rights, BCEA (Basic Conditions of Employment Act), Skills Development Act, B-BBEE: Employing someone is more than just a labour contract. Your workers have to develop your business for you, and you need to treat them accordingly. They are the means to build your business, and you will benefit if their own learning, skills and competencies improve.
13. All formal employment has to have contracts, even if they are verbal, with your workers. A contract is also the information that the worker needs to do the job best. However, you really have to appreciate your workers, as they are the means for your business to get ahead in the future, and it pays to invest in them. Develop a labour contract together with your workers in an open session where you discuss it together. Give your workers the rights that they are due but also note that you have to create a culture amongst your workers that emphasises their responsibilities to keep the farm and enterprise going. Give them rewards and they will create a culture that supports your enterprise. Do not cast their position as opposing your business but find the sweet spot where they see the value which they receive from the business, and how the business, through their work, creates this value for them and society.
14. It is important to streamline your workers' culture also with the overall culture and orientation of the farm. You are

there to build value for the community in producing food and in producing this food by harvesting the waste in the community. Through your endeavours, you are lowering food prices and enabling communities to influence their food choices in a positive way. This is the culture that you are creating, and this leads to your UVP which needs to be part of the labour culture on your farm. By creating such a culture, you will motivate both your workers and the community and build a system that creates value for all. Try this, when you succeed, it will take care of itself.

15. Economic and social governance: As an emergent entrepreneur, you should involve yourself with others, either in a dedicated multi-stakeholder enterprise development programme or with others like you who are also farming. Many of these arrangements will be governed by the Sustainable Development Goals, which we discussed in the beginning. These will be prevalent amongst agencies that can help your business grow, and the state will always have an eye on them. In these stakeholder engagement processes, and in the economy in general, people are attentive to transforming society through business. As an urban farmer who farms sustainably and regeneratively, you are, in fact, a highly lucrative prize and "statistic" for development agencies.
16. You yourself may be female, African and farming sustainably, and you should be selective as to what stakeholder engagement process you become involved in. Do not simply get involved in such processes and think if it does indeed benefit you. As a farmer, your first loyalty lies in your own sales and your own customers. This is why you farm. Get involved in a stakeholder engagement process only if you have a clear objective in mind by getting involved. This could be expanding to new markets, adopting technology or being involved in a development programme that will advance your business. Many will want you to become involved, but remember, you are a farmer to sell food and not to mingle and chat about ideas that may not help you.

Conclusion

Business registration and compliance is your signal to society that you want to be a responsible participant and citizen. However, practice your contribution to the social contract in spirit before you engage in the paperwork or registration. Be compliant to good norms and morals, and place the health of your community, the ecosystem and society foremost in your endeavours.

Registering a business and becoming compliant is a responsible endeavour. The greatest part of this is being financially solvent, and we will discuss that after the next chapter, where we examine sources of knowledge for urban agriculture.

Chapter Seven

Reading and viewing: How to interpret media for urban agriculture enterprise development

The proliferation of new media and an alternative agriculture

With the rise of the Internet, we have seen a proliferation of media – stories, videos, books and writing, often referred to as "user-generated content", and a lot of this is about agriculture. Although these alternative approaches are critical of conventional agriculture, they also sometimes advocate for an uncritical adoption of "new" approaches to agriculture. It may be unclear what is true and what is not.

What should you read and view in this situation? What is important, is not to necessarily spot untrue or misleading or "fake" news – this is also important, but to develop an approach to learning from scientific research and popular innovation, and to identify new themes and approaches to developing your own farm. In this situation, it does not matter if the media is false, what you will be doing is to simply exploit it for useful information.

Hence, in this chapter, we will give an overview of how you should develop your own knowledge and skills on urban agriculture enterprise development, how you should interpret and engage with these sources of knowledge, what you should be looking out for, what would be worthwhile considering, and how you will implement these ideas.

In this book, we are concerned with the development of small enterprises. Often, these cannot be "scaled out" and the option to expand the enterprise may, in most cases, point

to moving to a larger landholding. The approach in this book focuses on getting the most value out of a small piece of land, and, hence, the approach detailed here necessarily will focus on building efficiencies inside the enterprise and making the most of the "smallness" of the enterprise. Save one rand a million times!

Most approaches to enterprise development presuppose the opportunity to always "grow" the enterprise to a larger enterprise. Financial support, for instance, supposes that this is the path of enterprise development, and such finances can most often be repaid only if the enterprise becomes "larger". It is the "larger" volumes of trade in the future that justify extending credit. This growth to becoming larger supports the way that we incubate and finance new enterprises. Recommendations from this camp will only make sense if this is assumed. This prices urban agriculture out of the financing market. This approach is useful only if you have access to enough land to become "big".

Obtaining and reacting to new knowledge is important. However, when considering knowledge, it will be important in all cases to understand the necessary natural scientific basis of the knowledge. If you cannot trace any claim or new knowledge back to a natural scientific phenomenon, the claims are probably false. Sometimes claims are made in such a way that they can be tested, and in such cases, you must test the knowledge. However, you must be alert that the knowledge that you want to obtain should be "extendable" right through to retail sales. In such cases, you must be alert to the social cues that would make the sales of a product worthwhile. For instance, you may be selling food at low volumes and even if you sell everything on the farm you may not achieve a livelihood. In these cases, you need to diversify your strategies and develop higher value products, like liquid manure, or chickens, that you can sell at a higher profit. Chickens will eat what you cannot sell. In such a case, you need to sharpen your waste harvesting so that you can process the chicken waste to a liquid manure that commands a high price on the market that would make your efforts worthwhile. You could also grow food for your chickens with sprouting seeds, and this will be very effective, as you

can grow a lot of food for animals by sprouting seeds. In this case, the activity of sprouting seeds makes it worthwhile to grow chickens.

You should also keep in mind your labour productivity and its convergence with the use of technology. By linking your workers with technology, or, animal production, you can increase the return on this labour investment. By using labour to move, say, animal manure from pigs, to chickens (to eat the worms in the dung), then to earthworms, and then to the soil, the labour will be part of a *Nxazonke* – or cycle – of resource use, and the returns in this cycle to labour will include the pigs, the chickens, the earthworms and the soil. Because of the smallness of the enterprise, we need to intensify the movement of materials between the plants and animals on the farm. What you need to do is to read media for insights, clues and new approaches with the above in mind.

In this chapter, we will thus be focusing on the following:

- To identify a few worthwhile websites to consult.
- What to do to link your searching with the development of your enterprise: what themes, lessons and insights would be "strategic" and what themes, lessons and insights will have a "tactical" relevance to the development of your enterprise?
- Interpreting the media: what themes do you need to look out for? What would make the media relevant or irrelevant to your own strategy? I elaborate on a few worthwhile themes below. You should realise that searching and internalising new knowledge will become part of your everyday activities if you are a farmer. You will have to constantly search for and develop new knowledge about farming. This is where the life-long calling should be cultivated!
- Implementing the ideas you find on the Internet. What should you do when you implement these ideas? What process of testing and refinement will be necessary?

Strategic planning

Your approach to implementing these ideas is important. You should understand that some actions that you take will have "strategic" benefits in the future, and some actions are relevant as a tactic that will, over time, contribute to your strategic goals.

Most urban farmers will attract the attention of well-intentioned government officials, NGO workers and community members. They may offer all kinds of help and advice, but it will be important for you to be able to identify what support will be conducive to your own strategic interests, and what will detract you from what lies in your interest and what will benefit you. If you do not know what lies in your interest, you will be shunted along by anyone who offers "help". It is up to you to make the most of this help and note that those offering help will not know what lies in your own interest.

Your strategic interest should "filter" the kind of help that outside agencies offer to you, so that you can select or influence these agencies to do what really benefits you. If you know where you are going, it is easier to see what you need. Your interests would be guided by the unique value proposition that urban agriculture is able to satisfy. Any support or help that does not directly contribute to your UVP needs to be carefully evaluated.

You may be based on a school where your farm, and you, will often be asked to help with the feeding scheme. This may be important to do, as you may not be paying rent to the school, and they would need something in return for the access to land. In such cases, it would certainly be strategic to accommodate the request, but this may undermine your enterprise in the long run if this is not clearly negotiated. When you enter into a lease contract, try to specify what contribution you should make to the school and/or the feeding scheme. Try to find a way to benefit yourself in return, and keep in mind that you could train students, say, in seedling production, and in return, they will plant many seeds for you. You must certainly assist but note that the biggest impact that you can make on your community is to make food available at lower-than-supermarket prices. Hence, any help that contributes to this UVP would have

the highest impact on the community. We have proposed the following as a UVP for urban agriculture:

The creation of a price-reduction mechanism for urban agricultural produce through the local recycling and repurposing of waste

What this calls for is for you to channel and re-direct any support to you towards this UVP. Should you have to assist in the feeding scheme, try to link this with waste harvesting, seedling production, or to recruit parents for increased sales, so that your help with the feeding scheme comes back and supports your enterprise.

Should you be talking to parents, try to impress on them how your farm functions, and emphasise sales of low-priced produce, and the waste harvesting that offsets this reduction in price.

You can also contemplate a full training programme, and learners will work in the fields in return for training in agriculture.

Should the state be willing to help you, try to redirect their attention to the waste management system, and try to get them to deliver biowaste from parks and fields to your enterprise. Do not simply do what they want you to do but try to reorient their activities, so that it supports your enterprise.

The realisation of what is in your strategic interest, and the development of tactics (smaller actions that contribute to your overall goal) to achieve it, is perhaps the key skill that you need to build your enterprise. When you are in control of where you want to go, you can enhance this with a bit of a look at entrepreneurship theory.

Engaging with media

Searching the Internet is not as clear-cut as we may think, mainly because we are looking for something that the media may not offer. You will find it hard to identify media that links retail and production. Engaging with the Internet also means engaging with artificial intelligence (AI). You need to "train"

your profile on the Internet so that it knows what kind of information you want. Once you start viewing the right videos, and liking them, the AI will quickly respond and find additional related media for you. You would have to have sufficient data and time, but eventually the machine will realise what you like. You should also do your own searches, so that you can direct the AI even better.

Some of this will be "fake", and some of it will be useful. Once again, you could learn a lot from "fake" information if you know what it is that you need, which would be your own strategic interest. Hence you need to read "selectively" or "between the lines" to arrive at something called the "truth" or what you need to know. Remember, we can fool some people some of the time, but not all people all of the time. You need to opportunistically read the Internet for things that will contribute to the increased functioning of your enterprise.

What would be "true"? This idea drives philosophy and there are very many competing explanations of what "truth" is. Some think of truth as a correspondence to reality – a mirror of nature – but this is not so easy. We often do not deal with nature itself, but with a human-constructed reality in the social world.

In this regard, some conceive the truth to be that which all people will agree upon if they can clearly and freely communicate their thoughts to others. Upon resolving differences, a truth that all will agree on will come out. This is also unrealistic, as we often disagree with each other, but in the end, we have to decide for ourselves in a particular society what is valuable and "true".

There is no easy resolution to these differences. What you need to focus on is the usefulness and applicability of knowledge for your own farm. Should you know, what would contribute to your farm, its UVP, and the daily activities done there, you need to filter all support, help, information, and advice for its contribution to your strategic goals.

Sources of knowledge on the Internet

The Internet has become a "library" to all of us, and it is currently the first port of call for information. Note the differences in character of websites: some are clearly for entrainment purposes, some are serious academic sites, and some are even more serious governmental or international sites. There is a lot of disinformation available, and some of it is driven by ideological means. In the field of agriculture, there is certainly a "mainstream" discourse evident, and an alternative. You will be consulting both.

The spread of an alternative agriculture can be predicted by critical theory. Agricultural R&D (research and development) is decisively supported by the mainstream strategic considerations of large agribusiness and state planning – mostly for food security – and this has delivered a kind of knowledge with distinct features. However, as this R&D system drives out alternatives and smaller players, we see them emerge in new contexts and with new styles and ways of communication. We will be looking mostly at these alternatives, as these are often more appropriate to small-scale agricultural production.

Small-scale farmers, particularly in areas that are not well integrated with the global food marketing system, have proliferated on the Internet. Below, we will look at some of these farmers, and also look at more scientifically informed sources, to emphasise the scientifically valid approach to increasing the biological-base of our food production.

User-generated content media

Kataps Community Farm Africa. This site is perhaps the most important for an urban farmer. This farmer has investments in the game and many of his lessons can be readily transported to urban townships. I found his videos on chickens insightful, but sometimes some information is lost in the way that their English is used. He is clearly knowledgeable and there are lots of tips on how they make money out of farming. What is noticeable is his vertical integration. He manufactures many inputs for his animals on the farm. Doing so conserves value and allows you to produce higher value products, often from animals.

Elaine Ingham and the Soil-food-web School. Elaine Ingham and her co-workers are leaders in the study of soil biology. In her work, she has identified the importance of bacteria and fungi in the metabolism of plants and crops. She also runs a YouTube channel and her most accessible material will be found there.

Her work has led to the appreciation of this soil biology. Others have taken these ideas further and applied them and developed composting extract technologies. These compost extracts have the potential to replace a significant portion of chemical fertilisers on the farm. In this regard, see the Su-Johnston Bioreactor. Someone who has taken this one step further is Jay Young, and he has developed ways to use compost extracts on large landholdings. Build your own Su-Johnston Bioreactor!

JADAM Organic Agriculture https://en.jadam.kr/

JADAM Organic Agriculture is perhaps the most important source of knowledge for small and urban farmers. I found out about them by viewing their videos on making pesticides that do not need protective gear when applying them. I immediately realised that they have the right orientation behind their approach, and I noticed the emphasis on low-cost production. Their website is full of information, and I would recommend taking their suggestions to heart and implementing them. Spend lots of time on this site!

Andrew Millison is a permaculture designer and instructor from the Oregon State University. His work on YouTube is very impressive. Here, you will find not only interesting videos on permaculture and alternative ways to farm, but also a comprehensive course in permaculture design. You can view these videos and equip yourself to undertake your own permaculture design of your farm. You can even earn credits from these courses.

Living Seeds Heirloom Seeds. Living Seeds Heirloom Seeds and their farm is an enterprise clearly focused on the urban and small farmer and the urban gardener. This highly professional organisation has developed videos on sales for small farmers,

how to make your own tunnels, and they purvey a host of open-pollinated seeds that can be saved and re-used in the future.

Garden Fundamentals Some sites approach things a little more critically and sceptically than most. Garden Fundamentals often explicitly aim to investigate new approaches, technologies and crops. This healthy scepticism is important, and it is, in fact, not too difficult to spot disinformation when you can cultivate this attitude. In most cases, advice is only partially relevant to emerging farmers in the Global South, and identifying what is appropriate and what is not, starts with this scepticism.

Diego Footer Diego Footer offers a critical but productive view of many new technologies, and his contributions will enable you to cultivate a healthy scepticism. I found his analysis and use of the Su-Johnston Bioreactor highly informative and useful. Take a look! Another site that regularly de-bunks claims and brings some realism is The Hobby Farm Guys.

Food Forest Namibia. This is a classic "user-generated content" site. These videos tell the story of how a Namibian farmer designed and constructed a permaculture garden in driest Namibia. What struck me was the amounts of water that he could harvest during the rainy season in Namibia. He obviously spent a lot of time designing his garden, and he paid for his farm selling earthworms, often for as little as N$1 per worm. It is clear that this farmer is "farming" social media and donations with this site. This is one interesting way to capitalise the improvements on the farm.

On this farm, he created biochar, swales and ponds and technologies and labour regimes that are of some interest for us. It is also noticeable the many misunderstandings that emerge between him, a Namibian, and developed nations' audiences.

This site shows us what is possible with some planning and knowledge. The creator obviously has a source of income elsewhere, but he clearly makes income from his farm. In these videos, you will see how to make biochar (by making "fire"!), how to plan and design the flow of water, and how to integrate this with animals.

Amongst his videos, is a full tour of his farm, and it is really insightful what one can do to harvest water, even in one of the driest parts of the world.

Emma Naluyima

Emma Naluyima is famous for her one-acre farm, and her TEDx talk is really important. She also features in the video by the Ellen MacArthur foundation that shows what is possible on a small site. This video shows us how related challenges can all be overcome by integrated biological farming.

The key message of her videos is how she builds value with a vertically integrated farm. Much of what she produces is used again in the farm, and eventually, she sells only the high-value produce, like meat, whilst the crops are mostly used on the farm itself to feed animals. This is an interesting variation of the enterprise form and shows us why a vertically integrated system is justified.

In the Ellen MacArthur Foundation video, she shows us how she built an integrated system of production. This is where she divided her farm into four areas, and it is the interaction between these four areas, and the interaction from hydroponic fodder production right through to compost application in the soil that we need to notice. This hydroponic fodder production is the below-market inputs on her farm (and the source of abundance), and this is sustained right through the value chains right up to the high-value products. This is how profit is made. Here, we see how to construct a system of interrelated cycles of resource use, or *Nxazonke*.

Discover Permaculture https://www.discoverpermaculture.com/ https://bit.ly/3OZv4Ce. Geoff Lawton is an eminent permaculture designer and practitioner, and he trained under Bill Mollison the "father" of permaculture. Here, you will see what you can accomplish by designing for the flows of water, energy, materials and people, amongst others, on the farm. This site details both macro- and micro-interventions that you can make on your farm, and going through this site will be an education in itself.

The Market Gardeners Institute https://www.youtube.com/@TheMarketGardeners. This is a North American site, and note the differences with South Africa when you view this, and any other site. This site is focused on small farms, and the technologies and techniques can be readily adapted to South Africa. The technologies that they showcase are particularly interesting. Many of them you can make yourself.

No Till Growers https://bit.ly/4sBz76j. This is similar to the Market Gardeners Institute's site and is also North American. However, the techniques and technologies do not always seem to include retail sales. However, this site has videos made by farmers, intended for farmers.

The North American Experience

America and Canada have a notable small farming sector, and they are quite vocal in the media. For many, small farming is a political issue, and this is understandable, given the concentration of large corporates in American agriculture. There is also a well-developed system of support, devised and conceived through the so called "food stamps" programme (see Wholesome Wave at https://www.wholesomewave.org/history). In a nutshell, American municipalities subsidise food purchases at local farmers' markets. The farmers give a 50% discount on the use of American "food stamps" and are reimbursed by the municipality. Hence, the farmer receives increased sales and the customer receives a 50% discount. They found this worthwhile as farmers would spend most of that money in the local area, generating tax revenue. This is the base of the North American small farm movement.

In this "movement", there are clear leaders, including Elaine Ingham above, but take a look at the following sites:

Joel Salatin is a farmer who pioneered a profitable and vertically integrated farm in the east of the USA. See him at: The Lunatic Farmer: https://www.thelunaticfarmer.com/ and on YouTube: https://www.youtube.com/@farmlikealunatic.

This movement is wide, and consider: Seven Sparrows Farm: https://www.youtube.com/@SevenSparrowsFarm

Curtis Stone https://www.youtube.com/@offgridcurtisstone Curtis Stone made a name as an urban farmer and his video on making "$100K" on a quarter acre is a true classic.

Traditional Media

***Farmer's Weekly* South Africa:** https://www.farmersweekly.co.za/ *Farmer's Weekly* have archived all their articles on their site. This is a substantial resource for farmers. Note that this long-running weekly publication caters to all kinds of farmers, so some advice is aimed at larger commercial farmers. However, reading the *Farmer's Weekly*, we immediately realise the diversity amongst farmers in South Africa, and they carry highly pertinent articles that appeal to smaller farmers.

Farmers Weekly UK: https://www.fwi.co.uk/ There is also a *Farmers Weekly* publication in the UK. This publication is good to mention as it will give you a glimpse of farming in other areas of the world.

A notable resource, even if it would be quite extensive, is the website of the United States Department of Agriculture: https://www.usda.gov/ . Much of this information may be inappropriate or irrelevant to a small-scale farmer, but it is worthwhile to note what this site would contain. The USDA conducts market research and intelligence and forecasting, and here you will find information on global trade and production. The SA Department of Agriculture's site is: https://www.nda.gov.za/. Please note that South Africa has multiple departments that are involved in agriculture, and departments that deal with land reform, forestry, fisheries and environment are often combined with agriculture. You should also note that we have Provincial Departments of Agriculture, and many Local Governments have food security, home gardening and agriculture programmes.

Agricultural agencies, like the ARC. https://www.arc.agric.za/Pages/Home.aspx The Agricultural Research Council (whom I also serve) is a prominent agricultural research and development agency. After World War II, the world witnessed the proliferation of these, and the ARC was established in 1992/3, when research units of the then Department of Agriculture were consolidated

into one agency. The ARC specialises in agricultural research and development. Some of this is highly relevant to small farmers, but they serve everyone and conduct all kinds of research, from genetic modifications, right down to deep trench bed construction. I, in fact, drew on a research report on deep trenches before I started advocating for them. I could not trace this research report again, but I remember it successfully controlled nematodes but had a 300% increase in tomato yield. This was my inspiration!

You will find a lot of additional information on the information super-highway that is the Internet. The Internet is today not what we imagined it to be, and it reflects basic human nature, and unfortunately is not the solution to our information and democratic needs. However, it is super useful and is full of information. We need to enable ourselves to benefit from the Internet, and the way to do this is to strengthen our wisdom and ability to spot untruth. There is a lot of truth buried under untruth, and it is always accessible if we are able to critically strengthen our ability to interpret!

The Water Resources Commission is the source of much of the material that I consulted on deep trenches.

International NGOs also have made space available on the Web for agro ecology. The Global Resilience Design is one such site, but I could not find any information there on retail sales…

What should we be looking for when we view media?

As important as the videos that you view, are the themes that you have in your own mind when you watch them. The development of a perspective on these videos must run along with your own strategic interest, and, hence, we need to now identify the things that you will be looking for when you watch this media. Look for ways to save one rand a million times.

There are extensive themes that you need to keep in mind when viewing media. These categories of interpretation need to be relevant to your UVP, which includes:

- Production;
- Sales and retail;

- Waste exchange;
- Technology; and,
- Media and social media.

There may be other categories, like marketing or digital services, and you need to develop the key themes relevant to your enterprise in your own mind and interpretation. Before you view media, clarify in your mind what you are looking for. This ensures that you will be in control over the ideas and suggestions made and note how these could contribute to your own strategic interest. Your strategic interest is determined by what you want from the enterprise, and this is increased sales and higher earnings. Anything that you do has to contribute to this strategic goal.

Once you know what areas you need to focus on, we can read this media even more deeply, so that we can obtain pertinent information and insights. You are looking at ways to optimise your processes, by eliminating unnecessary steps, for instance. You could also be seeking lower-cost inputs like seeds and note the benefits of bulk buying. Bulk buying will make seeds available for direct sales and boost seedling production. So, searching for a "buy bulk and save" deal is worth it.

Below is a list of themes that you need to look out for when you consult media. These themes will enable you to identify what you need to look for and will also enable you to re-interpret what you see so that it fits your own enterprise.

- *Nxazonke*: Interrelated cycles of resource use. By moving manure or material from animals to worms, to chickens, to the soil, a complete cycle of value creation and resource repurposing takes place. The creation of such cycles is not always evident in farming operations, but such cycles occur all the time and are related to mega-cycles like the water cycle on earth. Building such cycles is building an agro ecology on your farm.
- When you view media, note how materials and resources flow in an operational farm. Note what can be done to create such cycles – mostly the moving of materials from one operation to another – waste from one cycle feeds

another. In this theme, look out for ideas like "multiple enterprises" or "multiple products", and note that these can be effectively produced by creating these cycles. This means that your farm will have multiple products and multiple cycles of resource use and repurposing. You will, thus, be selling both crops and animals, and also products like technology and you will be giving a service, like a training service.

- Agro ecology. Agro ecology is the ecology that results from how you construct processes on the farm and is the all-encompassing science behind the idea of *Nxazonke*. For conventional agriculture, the ecology is often based on a single crop and its production over the course of a year. An ecology results from the creation of interrelated cycles of resource use. You should construct an agro ecology on your farm that mimics or emulates the cycles of nature. In all these cycles, investments in the soil that you can make are fundamental. Read media with this in mind and try to spot what you can do to make these interrelated cycles of resource use efficient with no leaks between the cycles. Also keep an eye out for how you build the ecological foundations of your enterprise, and note a strong, robust ecology is what will produce for you in hard times.
- Vertical integration. When you manufacture all the inputs for your farm yourself, then you are vertically integrated. By being horizontally integrated, you will have to buy all inputs for the farm, and this will not be possible for a small farm. For a small farm, you simply have to build the interrelated systems of resource exchange, and this can make you vertically integrated. In Emma Naluyima's farm, it seems that she feeds all produce back into higher-order processes on the farm, and thus mainly sells her top products, pigs. It is noticeable that she does not sell a lot of the milk that she produces on the farm, but rather feeds it to her pigs. She thus avoids the profits that pig feed middlemen take, before the feed even reaches the farm. She also avoids the profit that milk-buyers will make when selling to the final consumer. By using the milk for her pigs, this profit is built into the final price of the pork. If this milk is produced

by cows on the farm, eating farm-produced grass, the value chain is highly vertical and locks value into the final product. This enables the small farmers to capture all the value in the value chain. This creates higher value as we go up in the food chain, and the inputs that she manufactures that are used mostly in the farm, ensures the production of a high value product – pork – at low to no cost for the farm. Almost all of the sale is thus profit.

- Middlemen, and intermediaries. As you need to build as much value yourself on the farm, and sell at the highest possible price, you need to understand the impact of middlemen on your profitability. In all cases of selling wholesale to middlemen, you lose value. The alternative is always to sell your products at retail level. The cost of these retail sales needs to be considered, and sometimes it may be better to sell to middlemen. Because you are operating on a small scale, you need to note this, as this is one sure way to lose value. Note the influence of middlemen, and work towards eliminating them in your farming operations, especially your sales.
- Technology. Technology can be a high tech, or a low, intermediate or appropriate tech. In the case of small farming, biological technologies, developed and sequenced as *Nxazonke*, is your first port of call. Deliberately search for these.
- Note also how to combine technology with infrastructure and labour. All operations on the farm must have technology built into the labour procedures, to ensure a return on investment. Workers working inside a tunnel or greenhouse will bring more return than workers working outside. If they work with or on technology, their efforts multiply. This can be multiplied even more with skills that the workers possess, and this is something to note. Note that you can blend high and low tech, and most low tech you can develop yourself. Note also social media as a technology and work towards integrating it with face-to-face events and activities.
- Investments: Your first investment is in the soil, and this investment will give returns well into the future. However,

the magnitude of your investments indicates responsibility and commitment to your farm. Investments are made so that return in the future will be higher. Be very careful with your investments and note your strategic interests. Think of your farm as a pyramid. The top cannot be there if there is not a sufficient base for the operations to achieve what you want at the top. Hence, build deep trenches. Acquire animals. Build compost piles that you will use in the future. Invest in technology. It is by making investments that future production costs are lowered.

- Soil is your first investment, but note also investments in training labour, in acquiring technology and in developing a sales presence. Identify what is foundational – deep trenches, a shop and technology – that are needed for future sales of a high-value product, like liquid manures. Investing in seedling production is also good, as you will need them, and they can be sold to farmers, which will create a need for services in the future, like liquid manure production, aggregate sales, or training.
- Multiplying efforts. When you combine skilled labour, using effective technology, under good infrastructure, planting good seeds in good soil, you multiply your efforts. A *Nxazonke* is one such combination, and this is the way to gain a good return on investment – by maximising productivity on minimum space. Note how others have combined systems. Note how individual systems work and sequence them with the next so that the wastes from one feed the next.
- Making small adjustments inside the enterprise. All enterprises evolve, and you as the entrepreneur must direct and guide this evolution. Once you have established your core transactions, and the operations and system that feed it, you have to constantly make these procedures more efficient. Eliminate steps in production. Sequence steps in your enterprise so that you have as few as possible. The best step, is no step. Eliminate unnecessary procedures and activities. This is how you save one rand a million times.

Conclusion

Reading the world is like reading a poem, and we often don't know what the real meaning is behind what we see. Often, there is no need for a "real" meaning. When reading, analysing and interpreting media – which are part of this world, it matters what you read it for, and what you want to gain from it.

As a farmer and entrepreneur, you need to be goal-directed. You need to identify your strategic interests – aligned with the unique value proposition that your farm can offer and translate this to a set of themes that you need to search for in the media. In this way, your "system of innovation" is informed by relevant and accomplishable tasks, from designing your farm, to developing and implementing your production system, to creating a waste exchange mechanism, technology and using social media.

Chapter Eight

Business and personal finance

Musimuni Dowelani and
Naudé Malan

Setting the scene

> *"An enterprise is a broad term that refers to any activity or business venture undertaken to generate income"* Ahmad and Seymour (2008)

In Chapter Eight: Business and Personal Finance, we explore the fundamental financial aspects of an enterprise. An enterprise encompasses activities such as selling products or services, managing resources, and meeting customer needs. Essentially, an enterprise is a structured organisation with the primary goal of generating profit and providing value to its stakeholders. This chapter delves into financial planning and accounting, and this is necessary for your own strategic planning. You need to know how much money you make, how much money is used by the business, and how to strategically use the money that you have.

Strategic planning

Strategy and strategic planning are important aspects of financial planning. Finances need to be used to ensure the functioning of the business, and many of these decisions will be tactical decisions, or decisions that you make that are immediately implemented to achieve the overall strategic vision of the enterprise. The way in which you use your money is important. You need to understand that money must be spent first of all to secure the functioning of the enterprise. Hence, you need to invest enough to build the base of the productive

systems of the enterprise. Remember, that you can only market what you produce, so to develop a marketing system, you must first ensure that you have a productive base. You also need enough produce to sell if you have a marketing campaign, and hence, you must first invest in this productive base.

Your strategic investments in the enterprise must be to secure the ability to deliver your UVP. Hence, you need to invest in production systems, like deep trench beds, you would need to establish a food-for-waste harvesting system, and you need to build a retail presence. Technology supports this. These are strategic investments, as investments in, say, a deep trench will pay off over many years. Once these are in place, it will be strategic to invest in marketing, but not before the productive base is built.

Hence, the sequence and order in which you make investments or purchases is important. You need to sequence the implementation of these systems in a strategic way, so that you achieve your vision of what you want your enterprise to be.

Hence, you will sequence your investments as you design your enterprise. Think about the following:

1. Your overall design of the enterprise is a priority, and designing your enterprise with your vision in mind can enable you to create savings just by how you lay out the farm.
2. Your productive potential: Invest in deep trenches, or, in rain-fed fields, and then plan for implementing deep trenches as you grow.
3. The infrastructure and technology need to accompany the development of deep trench beds.
4. You need to integrate animals into your production system, as they can process crops that you cannot sell, and animal and plant interactions create the *Nxazonke* cycles of resource use.
5. You need to integrate the customer into sales and waste exchange.
6. You need to develop a substantial retail presence and marketing plan in order to sell.

There seem to me to be more important issues that need attention first before you market your produce. A farm is a productive enterprise and can produce, manufacture and create new products and services. This must receive strategic priority over engagement and marketing as this is the base of the enterprise.

Moving from strategic planning to financial management

Financial management concerns the allocation of resources (money) at the right place at the right time in an organisation. We will examine how these processes contribute to the financial health of a business, focusing on the critical relationship between business operations and financial management and allocations. Ultimately, the success of an enterprise is gauged by its ability to generate profit and sustain growth over time, ensuring that both the business and its stakeholders thrive. This needs to be secured, as the profit that you make enables you to offer a waste exchange mechanism that indeed creates your UVP for the enterprise. Hence, your financial planning must prioritise the realisation of the UVP, and it is in this context that you must make your choices on where and when you invest the resources that you generate in the business.

Business finance

An enterprise provides a service or sells goods, which are physical items. An example of a service enterprise would be an agricultural consulting firm, while a farm supply store is an example of an enterprise that sells goods. An enterprise that sells goods can also be referred to as a merchandising enterprise. A farm sells produce, and you also offer waste services to your customers. Strategic and financial planning must ensure the protection of this productive base of the enterprise.

Six words that are commonly used in financial management will structure this chapter. There are many other ways to account for your finances and ultimately you would need a bookkeeper or accountant to "graduate" to a proper bookkeeping system where you keep a "general ledger" and all

your sub-ledgers that would account for individual items and categories of accounting.

However, understanding these six financial words will enable you to understand the financial standing of your enterprise. This knowledge of how much money you can make, how much is tied up in purchases and capital expenditures (capex), and how much cash you have to make these expenditures is needed to decide strategically what you pay for first and what you pay for later. The sequence of how you make these purchases matters, as a capex purchase should enable you to implement a new procedure or process in the enterprise, and this procedure or process must result in net value generated. Hence, an investment in an irrigation system is perhaps more important than investing in videos that aim to promote sales. Before you invest in videos to promote sales, make sure that you have enough deep trenches, irrigation, tunnels and seeds, for instance, to produce enough to market and sell.

You accounting depends, first of all, on your record-keeping. Start with a simple list with income and expenditure. Try to do more as we explained in Chapter 4, but a simple list will do. Once you have enough, start to develop a sheet with the six categories below. Take a look at the table reproduced and copy it or draw up your own.

The six words

These six words that you need to master interrelate and together form a bookkeeping system that enables you to stay on top of your enterprise's operations, income, and expenditure. This is a rudimentary system aimed to enable you to know what is going on in your enterprise. At a minimum, keep records of all expenses and income. If you can, record also what the income and expenses are, as this will enable your bookkeeper or accountant to complete your books, as they need to itemise each expenditure under a sub-ledger in your accounts.

The six words and concepts that you need to internalise and know about are the following:

- **Revenue / Sales Income** – The money that you make from each thing you sell or each service you sell. This is all the

money that you receive from sales. This is, in most cases, all the money that the enterprise brings in. If you are selling seedlings, all the money that you receive from seedling sales, indeed all the money from all sales constitute your sales income or revenue. If you are an enterprise that only gains income from sales, this will be your only income.

This income can easily be accounted for by simply adding up all sales incomes. If you do not receive any other income, this will be the overall turnover that you receive. Some are able to gain additional income from land rents for instance, and this also needs to be accounted for as this is also income.

- **Turnover** – The total amount of money that you get when you add all the sales income amounts together, and all other income. It shows you the total amount of money that you received from customers, and others. Some of you will gain income, say, from renting out your shop to a *spaza* shopkeeper. This is not sales income, but is income, and this contributes to revenue.

If you receive a grant from an enterprise development agency, this is part of turnover. Hence, your income in this year will be much higher. You would have to account for this money in a very careful way and note that it may affect how you make decisions on expenditure. You now have a large amount of money available, and it must be used for its intended purpose.

Should you receive a grant or a gift, you need to enter it into the books to see how it affects your enterprise. Now you must use this money to build your business, and you thus need to distinguish your own strategic interests from the interests of the development agency. They want to see you succeed, but you have to do the right things with this money in order to succeed. However, for you to succeed, you need to be aware of the importance of this grant in your enterprise. This grant needs to be used to further the productive potential of your enterprise – and is not intended for you to live off this grant. Hence, you would need to carefully use this grant. In most cases, this will be for a capital expenditure, like a tunnel or machinery or tools. This money must be used for what it is intended, but you need

to identify what is most important in spending this money. Take a look again at Chapter 4, where we discuss record-keeping, amongst others. Grant money must be spent as a priority!

- **Cost of sales** – You must pay these expenses to make a sale. The things that you sell have to be acquired. You will be producing at almost zero cost but somewhere you have to buy things. If you buy seeds to produce seedlings, you are incurring an expense. If you sell seedlings in the tray, the cost of the tray is part of cost of sales.

We have already calculated the overall turnover, including sales income and other income, and we know how much money is flowing into the business. If it is products, like wigs or vegetables, then the "cost of sales" is what those things cost you to buy or sell. Any marketing you do, is part of operating cost, but if you have a permanent sign advertising your farm, it is part of infrastructure. If you buy a bakkie, it is part of overheads, but the fuel that you use is part of cost of sales. Now we can start to calculate the overall amounts of expenditures in the business.

The cost of waste exchange sales will be hard to calculate. This is a cost of sales, as the sale costs you 30% more than if there was no exchange. One way to account for this is to account for the sale as sales income and then account for the R5 discount is accounted for as a cost of sales of R5.

Hence, cost of sales will have to include this discount that you give, and from here we will thus be able to internalise these costs and come to a conclusion that will be accurate. We have calculated the cost of this discount, and it is marginally on par with compost on the open market. Please also note that the opportunity cost of sourcing compost is outside the scope of calculations so far. We will account for transport costs to buy from compost sellers as part of overheads. This is where you save. At this stage of the enterprise development journey, you will not have time to go and buy compost on the open market. Even ordering online and paying for delivery is an opportunity cost. Harvesting and processing waste on site will avoid this opportunity cost, and hence, the profitability of harvesting

waste and processing it to compost increases. This intangible calculation is one of the arts of enterprise development. Sometimes you will know that you are making a profit even though you do not know the exact amounts of value.

- **Gross profit** refers to the money that you have left after deducting the cost of sales from sales income and turnover amounts. You have to calculate your gross profit to know already at this early stage of your enterprise development journey if you are making a profit. Here, you will deduct your cost of sales from your turnover (which includes gifts and grants). Now you will see if there are reasons to continue with the enterprise. If you are making a loss at this stage of your trade, you need to lower your cost of sales, and/or gain income from another source, like a grant. You would have to source seeds, for instance, from a cheaper supplier or harvest them yourself. If you cannot show a profit here, you need to consider changing the business or terminating it. You cannot yet pay yourself from this money.
- **Overheads or fixed expenses** – You have to pay for these expenses even if you do not sell anything, such as electricity, water, rent, and wages.

It is often hard to distinguish overheads from cost of sales. Labour for digging deep trenches, infrastructure like tunnels and irrigation systems, equipment and tools that you need before you make a sale, are part of overheads. This also includes rent that you may have to pay for the land. Equipment, from tools to personal protective equipment is part of overheads. If you pay for Wi-Fi at the farm, this is part of overheads. You should note and keep records of all food that you donate to a school where you may be farming, as overheads, as this is a form of rent. Note the amounts of food donated and record the retail price that you could have received for these donations. Now you can understand what amount you in fact pay for "rent" at the school. This is important information that you need to note for when you engage in negotiations to renew your lease.

Your overheads list will be long and by noting and calculating the costs of your overheads will enable you to understand how many resources you need to continue operating. This list will also show you what you use to keep the business going, and at this point you can perhaps eliminate unnecessary spending. There must be some kind of "balance" or relationship between your spending on overheads and your cost of sales and turnover. Generally, you should invest more in overheads than cost of sales, but this will depend on where you are in your enterprise development journey. In the beginning, you will spend more on overheads (and specifically on infrastructure) than on cost of sales, but over time, you would be spending more on cost of sales (and specifically marketing) as you establish your infrastructure and are producing. Some costs, like labour, will be influenced by your planning and when you plan to build, say, your deep trenches, as these are labour intensive.

This "balance" is thus not a 50/50 balance but is rather a strategic choice. Here your strategic interests must count, and you should juggle your spending and investments, so that you always build and enhance the basis of your productivity on the farm. One of the most strategic investments that you can make is to pay your workers without cash, say, by offering them a meal for labour, that is made entirely from produce off the farm. Because you cannot command economies of scale, avoiding cash inputs and using your own resources instead of cash is perhaps the most strategic choice that you can make. In this way, you de-link from the global market system, and create a local market of resource exchange. This is cheaper for you, as you always lose when buying on the open market, and you acquire the profits that you would have received, by "paying" with your own produce. You are paying them with the value that you have created.

- **Net profit or loss** – This is the amount left after deducting your overheads or fixed expenses from your gross profit.

You have already deducted your cost of sales from turnover to arrive at your gross profit. If there was a profit here, you will again deduct your overheads from your gross profit to arrive

at net profit or loss. This is the money that you have earned, and you can pay yourself only now. However, at this point in the enterprise, you need to exercise your strategic judgement. This figure is your EARNINGS BEFORE INTEREST, TAXES, DEPRECIATION and AMORTISATION or EBITDA. Should you be a fully fledged company, your accounting will now deduct interest on credit, taxes, depreciation of assets and amortisation (the amounts that you use when you pay off debt). You should not have any credit and should be paying minimal taxes (but your cost for a local authority trading licence is a tax). As you build your own infrastructure and DIY technology, they will not really depreciate, and you may not be paying off a mortgage on your land (accounting for this as rent rather). However, once you start to grow, your EBITDA will become an important feature of your accounting system. You can, strictly speaking, only pay yourself after accounting for your EBITDA.

The only way that you can improve your enterprise is to take some of this net profit and reinvest it in the business. You can also source at lower cost from suppliers, or eliminate them, such as when you sell seedings in hand-rolled newspaper punnets instead of trays. This is how you will improve the functioning of the enterprise, and this money needs to be invested to optimise or improve a current system (say, the upgrading of seedling production by building a small tunnel dedicated to seedling production), or to create a new production line. Should you have all of your land under deep trenches, you have already optimised your production potential, and then a better choice would be to invest in marketing, by, say, building a *spaza* shop and renting that out to a shopkeeper. These decisions you need to make on your own and no enterprise development agency can help you. These decisions are best dealt with by yourself and a business mentor, or by consulting a trusted fellow farmer.

Think of the sequences of production and enhance the base of this so that the whole system can deal with higher volumes of goods going through it. To make these kinds of decisions, go through a market opportunity analysis, as we did

in Chapter 2. This analysis should indicate to you where is the best place to invest in your business.

The journey to net profit

When an enterprise is established, it is for making money. This money is referred to as revenue (sales income). The primary goal of an enterprise is to maximise profits. After generating **revenue or sales income and generating a turnover,** an enterprise will make a **gross profit** after paying for all cost and expenses directly related to creating the good sold. **Operating income or profit** or **nett profit or loss** will be made by the enterprise when the enterprise has paid its operating expenses from its **gross profit**. **Cost of sales** and **operating cost or overheads** are essentially the total costs that arise from the enterprise carrying out activities related to the farming process and the selling of goods and services.

Let's use the case of Lungelo, who is the sole owner and manager of a small-scale farm in Soshanguve, to illustrate. The farm produces all kinds of kitchen vegetables which are sold on site by Lungelo. Lungelo's onsite shop is open at least six days a week, from 8 a.m. until 5 p.m. and the whole farm and shop employs one to three other persons. Lungelo received a R5,000 grant from a business incubator and is beginning to build his production system. He has decided to invest most of his time and money in laying out the whole garden and building deep trenches along the contours of the garden. He will build infrastructure later but will try to invest in an irrigation system from the start. He will build a small retail area where he will also exchange waste, and keep his rabbits and chickens close to the retail area.

Lungelo can achieve sales of R1,000 a day, sometimes about 75 bunches of vegetables. However, let's say 25 of these are with a R5 discount for food exchange. He has one person working full-time and two other employed for five days a week at R100 a day to dig and fill his trenches. Because his farm is on the family home and land, his parents allow him to pay land rent of R100 and R200 in water and electricity a week. At the end of each year, he makes a summary of operations in the income

statement for the enterprise. He owns enough equipment to make them work and has collected enough waste and discarded materials to fill the trenches and to build a small place for retail sales and recycling. His rabbits are in donated cages, and the chickens are free to roam in the space surrounded by the rabbit cages. He is already producing on some additional land and enough is available for the season, as it rained a lot (see the Chapter on How to Start).

Let's describe Lungelo's farm's operations for one week as we describe the financial processes above.

Sales income				**Totals**
	Monday	R15	50	R750
		R10	20	R200
	Tuesday	R15	30	R450
		R10	20	R200
	Wednesday	R15	25	R375
		R10	20	R200
	Thursday	R15	30	R450
		R10	15	R150
	Friday	R15	25	R375
		R10	10	R100
	Saturday	R15	10	R150
		R10	15	R150
				R3,550
Turnover				
	Grant			R5,000
Total income				R8,550
Cost of Sales				
	Seeds			R100
	Packaging			R100
	Waste Exchange			R500
				R600

Sales income				**Totals**
Gross Profit				R7,950
Overheads (operating expenses)				
	Labour			R1,800
	Water			R200
	Rent			R100
				R2,100
Nett Profit/ Loss				
				R5,850
		Without Grant income		R850

There are a few things to note with this financial statement:

You should note that the grant income skews the meaning of the table. This indicates income that should be used for more than one week, and mainly for infrastructure, to ensure that the farm can produce. This farm can make only about R850 a week profit, which may be enough considering the low expenses. Three workers also earn wages. This has strategic importance. The grant could be used to pay for two workers to dig trenches in order to safeguard future productivity. One worker should generate sales in order to safeguard cashflow.

This farm produces only a little as income. This may mean that the farm has not invested in enough products (it only sells vegetables) and is not getting enough productivity from the land that is farmed. This calls for investments in infrastructure, and product development. The recycling station should be adapted to make seedlings or liquid manure. It is clear that marketing should not yet take priority. At the moment, the farm relies on the rain-fed fields and has very little to sell. It must have another product available very soon, as the field crops will diminish. Investing now in seedling production is a good thing.

It will take time to produce these seedlings, but there are funds available for compost and seedling trays.

This means that the grant money should be used, but now this is a strategic decision based on what the enterprise needs at the moment. The funding is enough to continue with the deep trenches, and this is important. The production of seedlings is also done for own planting, and these need the trenches to make it worthwhile. Without this funding, and without knowing where the money is going, this decision would have been difficult.

Personal finance

The importance of paying yourself a salary as a business owner

Paying oneself a salary as the founder or owner of an enterprise is a critical aspect of maintaining both personal financial stability and the long-term sustainability of the business. By allocating a regular salary, entrepreneurs ensure that they can cover their personal expenses and meet financial obligations, reducing the stress and uncertainty that often come with running a business. This stability allows you to focus more effectively on growing the business, rather than worrying about personal financial shortfalls. Moreover, drawing a salary reinforces the legitimacy and professionalism of the business. It signals to customers, employees, and stakeholders that the business is being managed responsibly and with a clear understanding of its financial structure. A structured salary also helps in maintaining proper financial records, which is essential for tax purposes and financial planning. Additionally, it sets a standard for compensating employees, demonstrating that the business values its human resources, including the entrepreneur themselves. Paying yourself a salary allows you to insert your own strategic interests in the financial planning of the business.

- The benefits of structuring a salary
    - Paying yourself a salary as an entrepreneur is not just about drawing income; it's a strategic move that ensures

both personal financial stability and the long-term sustainability of the business.
- Regularly allocated salaries help entrepreneurs to manage personal expenses, thereby reducing stress and allowing greater focus on business growth.
- A structured salary enhances the legitimacy and professionalism of the business, signalling to stakeholders that the business is managed responsibly.
- Proper salary management aids financial record-keeping, tax planning, and reinforces the value of human resources within the business.

Prioritise the enterprise needs first

Make sure that the expenses on the enterprise are covered **before paying yourself a salary.** They are all necessary monthly expenses to ensure that the business's operational needs are met. Only after business expenses are covered should you calculate the available free cash flow to determine the amount that can be paid as salary. This salary should be included in the expenses of the business and accounted for in the books of the business.

Determining a basic salary

The enterprise should **set a practical and realistic salary** for all employees, which includes the owner(s) of the enterprise. The salaries drawn should take into consideration the size of the enterprise and the income generated by the enterprise. The entries should ensure that the salary of the owners(s) is paid out of the enterprise into the accounts of the owners. This allows the enterprise to **separate business and personal finances.** This is important because the absence of **financial separation** can lead to financial confusion and potential legal issues.

You will struggle to pay market-related salaries, and you may even be paying less than minimum wage. In the beginning, pay yourself a similar salary as your workers, and let them know this. This will bring loyalty but also force yourself to create savings in the enterprise, and that will lead to more profit, which you only can take for yourself. The minimum wage

for rural agricultural workers is R 28.79 per hour and this is just above R150 a day for an 8-hour day. Some urban farmers can pay this, but then the worker must have skills, and should be used only in a way that multiplies their efforts, say, in a tunnel or in using technology. Other workers could be paid a part-time salary lower than this. Below, we set out the basics of a compliant payslip. You should note this to see where you can improve your workers' welfare and where you can further professionalise your enterprise.

What should be included in a payslip or salary structure?

A payslip should include:

1. **Employee details:** This should include the employee's name, employee number, and pay period.
2. **Gross pay**: This is the total amount earned by the employee before deductions. It should include the basic salary, overtime pay, bonuses, and other allowances.
3. **Deductions:** This should include all deductions made from the employee's gross pay. These deductions may include tax, UIF (Unemployment Insurance Fund), pension or provident fund, and medical aid contributions. You may not be able to pay for these expenses, and hence, you need to think of your workers as temporary workers, and communicate this to them.
4. **Net Pay**: This is the total amount paid to the employee after all deductions have been made.
5. **Company Information**: The payslip should include the company name, company logo, physical address, and contact details.
6. **Payment Information:** This should include the bank name, account number, and branch code where the employee's salary is paid into.

Source: Accounting Boss (2024). https://bit.ly/4rYcGbp.

With your salary, make sure that you make provision for four important things

1. Your health expenses
2. Unforeseen large expenses

3. Unemployment
4. Retirement

A **medical aid fund** is a scheme that helps to cover the costs of healthcare services, such as doctor visits, prescribed medications, and certain treatments. It often includes both day-to-day healthcare needs and hospitalisation cover, depending on the plan chosen. Examples of medical aid providers in South Africa include Discovery Health, Bonitas, and Medihelp. **Hospital cover**, on the other hand, is a specific type of insurance or part of a medical aid plan that covers the costs associated with being admitted to a hospital. This includes surgical procedures, specialist consultations, and hospital stays. It is designed to protect you from the high costs of hospitalisation and major medical events. Examples of hospital cover providers in South Africa include Momentum Health, Fedhealth, and Bestmed.

Unforeseen large expenses may include funeral costs and weddings. Provision for funeral expenses can be made using a funeral cover, which is a common practice in South Africa. For weddings, it is advisable to save in advance, as this is typically a significant financial commitment.

Emergency savings fund: Individuals should aim to have savings equivalent to at least three months' worth of living expenses to cover any unexpected costs or emergencies. Unemployment can be covered by registering with the **UIF,** which provides financial support for a limited period if you are unable to work. This is a crucial safety net for many South Africans, as it helps to cover living expenses while seeking new employment. UIF contributions are calculated as 2% of your gross salary, with 1% contributed by the employee and 1% by the employer. Note that these expenses, and others, like the scheme under the Compensation for Occupational Injuries and Diseases Act (COIDA), may be out of reach for a new enterprise.

These social protections are necessary for any formal enterprise with full-time employed persons. You may not be able to afford this, but note this, as you are in an enterprise journey, and soon you may upgrade to a farm, where you can afford to pay these expenses. Do not look at these as expenses,

but rather as investments in labour. Should you upgrade to a formal enterprise, you can combine UIF, COIDA, skills development and employment security into a compelling labour proposition, – a really good job – for your workers. Now you can keep and secure the labour that you need, and build benefits for them and indirectly, for you.

We deal with all aspects of compliance in Chapter Six on Compliance and Registration.

Planning for the future

You should be thinking about your farm as a first step in one day acquiring a proper rural farm. However, no matter what you do in life, one day you will be too old to work, and it is good to save money for retirement. All that matters is your pension plan! Consider a retirement fund, or a savings platform like SATRIX. Do a lot of homework before you start saving and note the projected interest rates. Speak to your accountant.

Starting an urban farm may be done just to survive. However, it is a doorway to the real world of business and agriculture, and you will be able to determine your own life path by engaging with agriculture. Here, we build on the uncountable savings and productivity that nature gives us and it is by being prudent, future-oriented, and resource-conserving that an urban farm will thrive. Financial planning is not only about the money, but it also enables you to strategically see what you can do to change your circumstances. The above is only the first step in managing the finance of the business. With good record-keeping and close scrutiny of your finances, you will be able to make the right choice and decisions for your business.

Chapter Nine

Conclusion

In this book, we aimed to instil a realisation in urban agricultural entrepreneurs of the benefits of building interconnected ecological cycles of production, retail, technology design and engagement. It is in building sequences of biological cycles that value is generated. That is the meaning behind the appropriation of *Nxazonke* to reflect the creation of holons in a wholistic system!

The inspiration for this came from Dr Emma Naluyima https://emmanaluyima.com/. She has quite a following and see a fan: https://www.youtube.com/watch?v=u5TNTMc8nvE. The original video that inspired me was this one: https://www.youtube.com/watch?v=gQZ6S8OyzHM. Note that I am in constant interaction with many farmers, and I mentor a few as a business advisor, and it is from them that I have learnt the most. They must also forgive me, as with this book, I also saw their limitations and developed these ideas to overcome these limitations.

The use of these biological cycles, circles of *Nxazonke* is key to imagining the productivity of urban farmers, and the transformation of all farmers in general. Until now we have defined agriculture by its use of synthetic inputs, and the limits to these systems should be evident by now. The problem with this approach to food production revolves around the similarity of enterprises in conventional agriculture. In conventional agriculture, all inputs are sourced from global suppliers, the machines that they use are all very much the same, as are the seeds and also the markets – represented by fresh produce markets. In this system, the only way to survive is to get big or to get out.

The sequencing of biological cycles creates value simply by feeding waste of one process to another, and the soil itself does this to a great degree. I realised that the value that is lost by ignoring these cycles can be recovered by designing a production system that uses these cycles. The design of the production system led me to design the waste-harvesting systems as circles between the farmer and the customer. The engagement systems described here make these circles real and it is easy to design, build and implement a system like this. That is what this book describes and advocates for.

Urban agriculture may one day emerge as a key agricultural sector, provided that we make available 30% of urban lands for agriculture. The reality is quite different. These ideas will come to fruition in a context of a sufficiently dense urban settlement, and when biological materials are available. That is where these ideas can be successfully implemented. Urban agriculture takes place where people are neglected, either by the global and supermarket food provisioning system, or by town planners who may disregard them, and by consumers who think we can only buy from formal and highly developed shops. The focus on the smallness of the enterprise and the steep profit profile in fact is what creates these opportunities.

Urban farmers need to be mindful of the competition in food markets. The reality is that this is a contest, and urban farmers will compete with each other. This will make demands on you as an entrepreneur. You should be attentive of this competition amongst each other. Undue competition could undermine everyone's livelihoods. To combat against this, note the following:

- Some farmers may change their enterprises to focus on the manufacture of inputs and waste-harvesting. In this approach, the development of liquid manures and composts, worm casings, worms, and the technology (the wormery) would be important.
- Farmers should structure their sales strategies to immediately focus on the neighbours surrounding them. This will avoid undue competition and create dedicated markets for each farmer.

- Farmers who are in competition should collaborate for larger and more distant markets. There are a few independent retailers in large cities who focus on sustainable food and source directly from small farmers. These retailers are in need of ESG (environmental, social, and governance) facts and data, and amongst a few farmers, this need can be satisfied and may make higher returns possible. Let the price dictate this arrangement.

Urban farmers should also be mindful of their own abilities and capacities. Learning how to develop a small urban farm and gaining some success through it sets you up to do well once you gain access to larger land. This may be more possible in a smaller town, or on the immediate outskirts of a larger settlement. Being on the outskirts may make more land available. In such cases, one can develop a fully independent farm that uses the technologies and approaches described in this book and integrate it tightly with the shops and customers in a settlement.

The development of deep trench beds is also a 'commodity' that can be sold. The value of the materials in the ground and the value of the efforts to build it is eminently sellable. This means that you should structure your lease agreement in such a way that you could 'sell' this access to the land, and a next farmer can continue and perhaps also improve on your practice. To accomplish this, we need many farmers who are capable and are knowledgeable of the technologies and approaches advocated for in this book.

This book deals not only with agriculture, but also with the retail opportunities to sell food. The experience gained in doing that will stand anyone in good stead and will open up new opportunities in the retail space. Be aware that once you are able to produce and sell on your own, that you are in possession of key skills that any other enterprise will value. Develop a great CV and add this to it!

Circular enterprises

The idea of a circular enterprise, in a circular economy is the new perspective and innovation I want farmers to take at heart. The video by Dr Naluyima is a great illustration of it. However, there are others, and take a look also at Joel Salatin's website, 'Farm like a lunatic' for additional ideas.

The transformation of waste to food for another organism or cycle is the bedrock of a biological production strategy. In this strategy, you would want to mix crops and animals, as these two form a natural circle. Exploit the accumulation and movement of materials and harvest them regularly from your environment. Create systems where waste from one feeds another. Also note that any biological production strategy must identify and utilise a source of abundant biomatter. You need to find this abundant source near your farm and move all these materials to your farm. You want to add more biomass than can be produced on your farm, and the more that you add, the higher the capacity of your soils will become.

This abundant matter can come from anywhere. Note the foliage and trees in your area. Find a farmer who may

have excess biowaste on their farm. Go to butcheries and abattoirs and receive their waste and move it to your farm. Form a partnership with the parks department so that you can receive their grass clippings etc. Form close relationships with customers and harvest all their waste. You need a dependable stream of biowaste, and this must be processed on the farm, and this is the future productivity and profits of the farm.

Conclusion

The approaches and programme sketched in this book is at the moment only partially realised. Many of the things that I describe have been implemented by farmers, but this really only creates a base for a new practice that is open to being studied scientifically. It is important to establish improved practice before we conduct scientific research. Scientific research cannot tell us what will work in the future and can only tell us what did work in the past. Hence, to gain scientific credibility, a concerted effort between scientists and practitioners is needed. Practitioners need to develop and pioneer new approaches, and only after this is accomplished can we study these practices scientifically. Of course, we can use science to make predictions about the future, what could work, but this is a guess based on fact and is better than a guess based on another guess. However, to create a complete scientific and action research cycle between scientists and practitioners, we first have to creatively develop new approaches and then test them. 'Testing' them can be accomplished by farmers, and in the scientific research project, the farmer will still have to grow and develop – and 'test' these crops. The scientist does nothing but observe and interpret. In all cases, it is the creative development of answers that sets in motion the opportunity to conduct a form of action research.

I hope to do so in future with *iZindaba Zokudla* and present this upgraded material in the *iZindaba*. Farmers need to implement these recommendations and ascertain whether they will work. This can then be taken up by research, and even probing and collecting what farmers feel about these new approaches would suffice. If farmers feel that this works, it works, and the iZindaba Zokudla that I host alongside this book

is designed to accommodate these insights, share and spread them amongst others, and reflect and test them in a dedicated way. What is needed is for urban farmers to boldly implement these ideas, evaluate them, change them, and continue until it works. Never look back!

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The approach taken in this book is to consolidate diverse and fruitful approaches into a sensible whole. We need to overcome the fragmented nature of the advice that urban (and many small) farmers receive, no doubt clouded by the diverse and often contradictory aims that we want them to realise. Our advice and support must aim to protect their strategic interests – to be able to deliver food at competitive prices in ways that build the resilience of society.

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