

# Chapter 3

## Interventions and Implementation Needs for Sustainable Dryland Development

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### 1 Introduction

The CGIAR Future Harvest Centres carry out agricultural research to support development that combats desertification. With a wide array of partners around the world, we have been studying the problem for three decades. I want to share with you some of our observations on ways to improve the success of interventions and their implementation.

Desertification is a downward spiral, with a dead-end outcome. Towns are abandoned, livelihoods are lost. People become refugees or are driven to crime and violence as they fight over dwindling resources. The world must help these people to find a better future.

### 2 Loss of Land Cover: The Direct Cause of Desertification

To implement the right solutions, we need to be clear on the causes. Dryland degradation breaks out in patches where droughts, overgrazing and overtillage strip away the vegetation. This loss of land cover is the central cause of desertification.

Agriculture is the biggest user of land, and the largest employer of people in the drylands – most of them poor. Without vegetation, these rural poor have no means of making a living. Restore the vegetation, and life blooms once again.

When vegetation is lost, the topsoil blows or washes away, leaving impoverished soils that make it much more difficult for vegetation to recover. If the pressures persist, degradation can become a permanent feature of the land.

The poverty-stricken communities suffer the most, and sometimes they cause dryland degradation by growing crops year after year without restoring the fertility of the land, simply because they cannot afford to do so. We call this “soil mining”

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because it is like taking from the bank but never replenishing it. Eventually, the land becomes bankrupt and has to be abandoned. But who can begrudge them when they are just struggling to survive? The land is all they have. Once its productive capacity is lost, they're lost too. They know this, and they would like to sustain the land for their children. It is our job to help them find practical ways to do that.

However, it is not just the poverty-stricken who cause land degradation. Wealthier land users also overgraze these fragile areas, and often more rapidly. Government policies also inadvertently reward land degradation.

Large-scale development subsidies in the fragile drylands have sometimes unintentionally caused a lot of harm; for example, those that encouraged the draining of the Aral Sea for irrigation and large-scale mechanized tillage of these fragile soils, which created a desertification dustbowl nightmare in Asia. Moreover, when disaster aid compensates herders in the Middle East for losses of sheep following droughts, it unintentionally encourages larger herds, since the risks have been assumed by the government.

### **3 The Integrated Ecosystems Approach**

We need a better way. In the past, most interventions have been sectoral, addressing either agriculture or environmental issues, but not both. Yet this is an artificial divide. Agriculture and the environment are interdependent. We cannot simply strip the land bare and then hope for the best. We need to respect and maintain the balance between natural ecosystems and agricultural ecosystems.

Natural ecosystems sustain agricultural ecosystems by providing goods and services like biodiversity, traditional foods, feeds and fiber, fuelwood and construction material, restoring the fertility of the soil, controlling weeds, and pollinating crops. And agro-ecosystems provide people with the incomes they need to be able to re-invest in protecting the land instead of mining and stripping it into oblivion. Both of course are affected by human and social factors, such as policies and markets, which influence the decisions that land users make.

Sustainability in the drylands will depend on learning to manage these interdependencies to keep both natural and agricultural ecosystems healthy. We call this taking an *integrated ecosystem approach*.

The integrated ecosystem approach implies that we need to find win-win solutions that both “save lands” and “build livelihoods”. Without the reward of better livelihoods, land users will not invest in protecting their lands. And if we don't protect natural ecosystems, agricultural ecosystems will degrade until they become barren.

### **4 Putting the Integrated Ecosystems Approach into Action**

To achieve this dual benefit to both lands and people, we have to change our ways of thinking. I want to highlight five changes in mindset we need to achieve in order to succeed.

1. To go beyond thinking of natural ecosystems as a bottomless well, there for the taking to drive our agricultural systems, we have to pay close attention to the balances, flows and interactions that sustain these systems.
2. We have to recognize that natural ecosystems produce valuable goods and services; so it makes good sense to “pay” for them by taking better care of the environment.
3. We have to think differently about the domain we work in. Ecosystems cross political boundaries. For example, changes in water and nutrient supplies upstream affect the water catchments downstream in a different country. In a similar way, our technical and scientific institutions cannot artificially separate themselves from the policy environment that will largely determine whether their technologies have any impact or not. We have to take a holistic, systems approach.
4. We have to change the tendency to think only about the limitations and risks of the drylands. We need to remember that the drylands also have advantages, such as plenty of sunshine and warm temperatures that favour the growth of a wide range of crops, and are less prone to livestock and human diseases. Some of the most productive agriculture in the world is in dryland areas. We need to envision the potential of these lands and peoples, and then work towards that vision rather than just managing misery.
5. We have to change how we think about diversity. For too long, agriculture has tried to reduce diversity, preferring monoculture on vast areas to supply just a few food commodities. A lack of diversity is especially risky in the drylands, where drought can wipe out a crop and cause famine. We have to use diversity to reduce risk and increase sustainability.

## 5 Diversification

By intermixing tree, crop and livestock operations, farmers can increase their incomes, provide more gainful employment for youth, and reduce their overall risk. But how can we implement diversity in a world that demands simple, uniform, high-volume solutions? I want to spend a little time on this issue, because I think this is a key dimension.

Diversity creates complexity, which is good for the environment but sounds difficult to manage. How do we scale up solutions when they have to be different in every situation to meet the needs and characteristics of local lands and communities?

We can do it by involving those who live on the land. We must provide a wide range of options for land users to choose from, not just single magic-bullet solutions, and these should not be inflexible, finished options – they should be prototypes that can be customized by communities to fit local conditions and needs.

This is a different way of doing business from what we are used to, so it requires major changes in our thinking and our approach. Since we need to involve land users in order to implement diversity, we need to spend more effort on understanding how land users adopt new technologies.

## 6 Sustainable Development Pathways

Poor land users do not just jump from simple to complex systems in one big leap. Instead, it is a series of small steps, adapting and fine-tuning along the way. As they adopt a new practice, if it is profitable or good for them in some way they will be motivated to adopt the next practice and so on, climbing the stepladder to prosperity.

So in implementing solutions, we need to be clear on how those solutions will start land users moving along such “*sustainable development pathways*”.

An example of a sustainable development pathway that combats desertification is a technique we call fertilizer microdosing. By reducing the fertilizer rate to a very small microdose dropped in the cavity where the millet seed is sown in the Sahel, fertilizer use becomes more affordable and profitable. By overcoming the fundamental constraint of nutrient deficiency, microdosing causes yields to rise 50–100%. Because it is profitable, this first step gives farmers an incentive to take a second step, namely to work together to buy fertilizer in bulk at cheaper rates the following year, further increasing their profits and their motivation.

Once they are working together, they will take the third step of using their group as a means to share knowledge and obtain improved seed varieties that respond better to fertilizer, and to grow different crops. This adds still more to their profits. This development pathway increases the amount of vegetation protecting the land while at the same time improving livelihoods.

## 7 Profiting from Diversity

For better or worse, money makes the world go around. Diversified farming systems have to earn farmers an income or else they won’t adopt them. Today’s supermarket culture demands that farmers focus on a few highly uniform commodities rather than a diverse basket of products. And most environmental services are treated as free public goods. So how can a land user make a living from diversity?

This is a tough issue with many aspects. We know it is difficult to change people’s eating habits or to rewire the global economy to start paying for environmental services, though many important efforts are underway to achieve this.

There are many dryland products that already have local and global demand, but producers have not been well organized and most of the profits are gained by intermediaries or retailers. We can help rural communities capture a larger portion of the profit pie by assisting them in carrying out some processing and marketing steps themselves.

Non-governmental organizations in the developed world can assist by reducing the red tape to provide access to their lucrative markets, and sharing the knowledge needed to give underprivileged communities a competitive edge. They can also educate foreign consumers on the benefits of supporting sustainable agriculture

through fair-trade mechanisms. Also, urban centres in the developing world are rapidly growing and will pay for diverse indigenous products because they are familiar.

Technical interventions and policies are critical because these determine the market competitiveness of agricultural products. We need to help land users in the transition from costly, artisanal production to more cost-efficient practices that are well integrated within market chains.

And policies should not embrace foreign subsidized imports that put local producers at a great disadvantage. They should establish a level playing field.

Through efforts like these, we can help impoverished land users capture the dollar value of diversity so they will be motivated to implement such actions on their farms.

## 8 Enhancing Knowledge-Sharing

Clearly diversity demands much greater sharing of knowledge. Sustainable development pathways, for example, require knowing when and where fertilizer can be bought at the best price, new crop varieties, new crops and ways to grow them, markets and daily price swings, export opportunities and so on.

This is where the underprivileged are at a real disadvantage, because of illiteracy, isolation and neglect by society. As we implement solutions to combat desertification, we must place major emphasis on closing the knowledge gap. Fortunately the information technology revolution gives us fantastic new tools, if we adapt them for the rural communities.

We should not think that they cannot join the ICT (information and communication technology) revolution. The spread of satellite dishes, cellphones and radios in remote villages demonstrates that they readily absorb new technology when it is affordable and manageable. Farmers need not become computer experts. For example, information from the Internet can reach these communities by using 'old technology', namely notices on a blackboard or announcements by bullhorn.

Though farmers may not be able to use computers themselves, village moderators can help them find the information they need. These moderators become bridges, brokers and catalysts for sustainable development and their role goes beyond just an information pipeline. They are also key actors in bringing communities together to work for the common good. For example, to manage rangelands in ways that are sustainable for everybody in the long term instead of a free-for-all exploitation for short-term gain.

We, as implementing agencies, must focus on ways to get land users involved and working together. We need to provide options that give them tangible rewards in the short term as well as in the long term. Rural knowledge brokers will be key players in the successful implementation of more sustainable land management.

## 9 Beyond Managing Misery

I want to close by emphasizing that the potential of drylands is great, much greater than we are usually led to believe by the stories of suffering that dominate our media. Better and more sustainable livelihoods *can* become a reality if we provide our assistance in different ways than in the past. The interventions and implementation must be holistic, diverse and knowledge-based and include social, economic and environmental considerations as well as technology. Simple magic bullets won't work.