

An aerial photograph of terraced rice fields in a mountainous region. The fields are filled with water and young rice plants. Several people are visible working in the fields. A network of white lines and dots is overlaid on the entire image, creating a digital or interconnected look.

# The secret ingredient of effective sector strategies

## How to leverage a sector's shape and market forces

This *NewForesight Insight* is part of a series of actionable primers on our core thinking tools, used to drive sustainability strategies in a complex world. The models presented in these papers have been developed and honed through years of work in over fifteen international agri-food sectors, mainly coffee, cotton, cocoa, seafood, and palm oil; but you will find that the thinking applies equally to sectors outside agriculture. For more *Insights* and other supporting material, visit the ever-growing collection of knowledge on [www.NewForesight.com](http://www.NewForesight.com).



### About NewForesight

In a time where we are confronted with increasingly complex and global sustainability challenges, the question is not whether we will deal with them, but how. At NewForesight we turn these tough challenges into shared opportunities and added value, on the intersection of business strategy, global value chains, and local realities. Since 2008 we have been supporting the world's leading multinationals, multistakeholder platforms, and public and not-for-profit organizations to turn their vision into real-world impact.



## Abstract

This NewForesight Insight paper introduces and substantiates a powerful system thinking tool: the ‘Shapes & Forces’ model. This model considers the shape of an agricultural sector as a function of the complex interaction of the forces that affect it, in the context of poverty-stricken agricultural sectors in many low-income countries around the world. First, it establishes the relationship between the levels of professionalization in an agricultural sector with its ability to adopt sustainable practices in order to show what the desired direction of change in many sectors is. Then the model assesses how the characteristics of a sector’s production, its market, enabling environment, and the existence of alternative livelihoods for producers, all affect the shape of a sector, and thus its ability to adopt sustainable production practices. With the insights from this model, you will be better equipped to think holistically about systemic change and devise strategies that affect the broader forces which drive unsustainability in various sectors around the world.

## 1. Introduction

In spite of growing environmental and demographic pressures, our global agricultural system—which provides livelihoods for one in every seven people on the planet<sup>i</sup>—remains marred by poor working conditions, child labor<sup>ii</sup>, pervasive poverty<sup>iii,iv</sup>, and unsurpassed environmental degradation. These challenges are only set to grow: projected doubling of food demand over the next 50 years poses enormous challenges for the sustainability of food production practices, and the resilience of our land and water ecosystems.

At the same time, public and private sustainability initiatives over the last 20 years have arguably achieved limited to no structural impact, due to the fact that they have targeted the symptoms rather than the root causes of unsustainability. They focus on local projects, without addressing the structural market forces that reward unsustainable behavior in the first place. As a consequence, these initiatives remain focused on output, rather than outcomes—and define success as relative improvement over their competitors or the baseline, rather than on achieving the absolute progress doing what is needed. As a result, we are still stuck on the road to increasing ‘unsustainability’—

encountering unwanted behavior and perverse incentives at every turn.

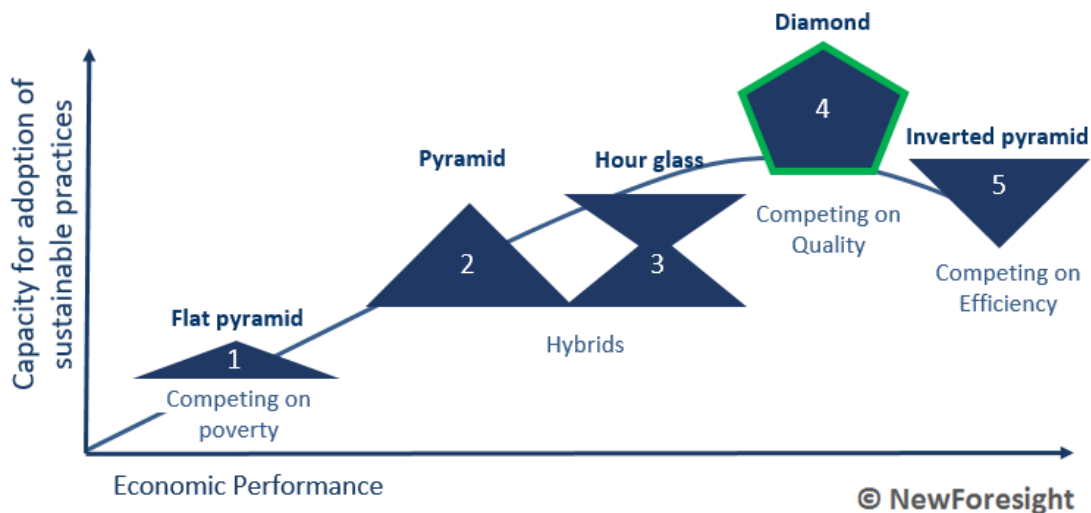
Meeting the increasing demand for food without compromising the future of our ecosystems requires intensification of agriculture, combined with approaches to reduce and remedy environmental and ecological impacts. Since the bulk of agricultural production in the world is concentrated in smallholder farms in developing countries<sup>v</sup>, the success of scaling sustainable production practices in agriculture depends on the ability of sustainability efforts to reach this group.

The level of professionalization of different agricultural sectors in the world is remarkably diverse, as are the sustainability challenges they face. The cocoa sector in Ghana, for example, is characterized by poorly organized smallholder producers, and plagued by decreasing productivity, systemic poverty, and child labor. At the other end of the spectrum, a highly organized sector such as corn in North America, consists of concentrated producer organizations

which reap the benefits of economies of scale, and externalize their environmental impact in an effort to drive down production costs and remain competitive. In their own ways, both of these sectors compete on low prices and paper-thin margins, and are locked in a downward spiral in terms of sustainable production. However, despite having similar challenges, the root causes of their problems differ radically. Already by sketching these cases superficially, we begin to discern how the level of professionalization and organization in a sector determines both its sustainability record, but also its general economic performance.

The sector ‘Shapes’ model fleshes out the implications of a sector’s prevailing level of organization and professionalism for its ability to structurally implement sustainable practices. The ‘Forces’ model, in turn, interprets the effect of four key sector characteristics on a sector’s ‘Shape’. These insights equip you to think holistically about systemic sector change, and empower you to devise effective strategies that take these sector dynamics into account.

**“Most agricultural sectors compete on low prices and paper-thin margins, and are locked in a downward spiral in terms of sustainability of production”**



## 2. The Shape of a sector

Understanding the challenges on the path towards sustainability in a sector involves taking notice of the distribution of producers at each level of organization—a spectrum ranging from low-intensity, unorganized subsistence smallholders, through increasingly professionalized and organized entrepreneurial producers, to highly-organized commercial producers (see Figure 1). To illustrate the relative size of land managed by each level of organizational capacity, imagine a pyramid, at the base of which are many smallholder producers who generally produce at a

relatively low level of intensity<sup>vi</sup>. The relative level of professionalization and organization (e.g. into cooperatives or estates) increases from the bottom to the top of the pyramid, with the top-tier representing the most competitive commercial farms.

Based on the percentage of total land in the sector that is managed or exploited by a certain level of organization, we distinguish a total of five agricultural sector shapes, each with their own characteristics and dynamics: (1) *flat pyramid*, (2) *pyramid*, (3) *hourglass*, (4) *diamond*, and (5) *inverted pyramid*. The shape of a sector, we argue, strongly impacts not only on the average economic

performance of the sector, but also on the dynamics of this performance—i.e. to what extent producers in the sector compete on poverty<sup>i</sup>, on scale and efficiency, or on added value (in terms of socially or environmentally responsible production). Ultimately, the sector shape impacts the sector's capacity to adopt sustainable production methods.<sup>vii</sup>

### 2.1 Flat pyramid

The predominant shape that defines many farming sectors across the developing world is a 'flat pyramid'. The base of the pyramid consists of large numbers of generally poorly organized smallholders, who occupy almost three-quarters of all farm land, and are fully dependent on small-scale farming for income. These impoverished producers are forced to compete on *poverty*, whilst a lesser number of better-organized and professional producers exist at the top. These better-off producers, however, do not necessarily produce in a more sustainable manner, but their higher income provides them with greater marketing leverage and the capital to make investments that enable greater efficiency or higher average yields, than those achieved by unorganized smallholders (See



Figure 1. Pyramid: a prototype for the shape of a sector

<sup>i</sup>'Competing on poverty' means that producers are forced to eschew sustainable practices for

the cheapest methods of production, just to survive in the market.

Figure 2, shape 1). Trapped in poverty and with limited access to markets, the majority of producers in a flat pyramid sector suffer the worst consequences of unsustainable sectors, and are afflicted by numerous human rights issues such as slave- and child labor.

## 2.2 Pyramid

The regular 'pyramid' is another shape in which the base consists mostly of smallholders, but unlike its flat counterpart, many producers in this sector are organized in producer organizations or manage larger scale farms. These larger, better-organized farms make the sector more productive through *economies of scale*, often accounting for almost half of the production in the sector. The downside of their increased productivity is that they drive prices low enough for the sector to reward unsustainable practices for all players, as a means to cut costs (See Figure 2, shape 2).

## 2.3. Hourglass

The 'hourglass shape' is a hybrid sector. On the one hand, a large number of professional large-scale producers compete on maximizing *efficiency* in production. On the other hand, similar numbers of low-intensity, unorganized smallholders still manage to hold out by competing on *poverty*, eschewing sustainable practices for the cheapest methods of production (e.g. slave labor and slash-and-burn deforestation) in an under-regulated system. The hourglass sector, to an equal degree as the pyramid, frequently makes inefficient use of fertilizers and other inputs, polluting the water and soil, and leading to loss of biodiversity. In terms of social costs, power concentration in commercial producers,

**"...unorganized smallholders still manage to hold out by competing on poverty: eschewing sustainable practices for the cheapest methods of production"**

when combined with weak or poorly enforced land and resource laws often works against the customary land rights of indigenous peoples and ignores the hazardous working conditions for agricultural workers (See Figure 2, shape 3).

## 2.4. Diamond

The 'diamond' shape characterizes more mature agricultural sectors, where markets reward *quality differentiation* in products (including a minimum level of sustainable production practices), through differential payments and certification schemes. The producers of higher quality agricultural products are often medium-scale producers or smallholders who achieve high and better quality yields not through economies of scale, but by better and more efficient organization and product differentiation. Smallholders at the lower end of the diamond sector continue to have competitive disadvantage because they lack capacity and inputs to differentiate, but the overall degree of scale and organization in the sector allows for intensifying production in a sustainable manner (See Figure 2, shape 4).

## 2.5. Inverted pyramid

Most agricultural sectors in high-income and upper-middle-income countries are dominated by farms of considerable size with competition between them revolving around technology-driven economies of scale enabling *cost-cutting efficiency*. The concentration in

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production brought by competition can shift these sectors beyond the hourglass or diamond shape, to an 'inverted pyramid' shape. In terms of sustainability, inverted pyramid sectors are not optimal, as the high output, low diversification and commodification of products often leads to excessive exploitation of natural and social resources and the discounting of externalities. This is so, because in highly industrialized agricultural sectors, land and soil are treated as a resource to be tapped, not maintained (see Figure 2, shape 5).

## 3. Sector shapes and sustainability

We argue that not all shapes of agricultural sectors are equally able to structurally adopt sustainable practices and carry the weight of sustainable intensification. As visualized in Figure 2, economic efficiency and productivity may well increase with the extension of farm size and greater mechanization, but the ability of the sector to adopt sustainability practices tops out at a certain level of economic concentration. Below a diamond-shaped sector level of organization, producers are simply too small and scattered to be able to organize themselves and profit from extension services or credit to increase their production and crop quality. Conversely, above a diamond-shaped sector level of organization, a small number of large-scale landowners consolidates their position by emphasizing technology-driven economies of scale, and fully exploiting natural resources.



The capacity to adopt sustainable practices seems to be the highest in a diamond shaped sector. Mind you, diamond-shaped sectors are not immune to any of the social and ecological problems that characterize the rest of the shapes described in our model. However, since they show a good level of organization and in most cases have a substantial professionalized segment of small and medium sized entrepreneurs with a better understanding of the market and more negotiation power, they are more resilient and better equipped to withstand the downward market pressure of low margins on their production. Additionally, higher disposable income means producers in this sector are more likely to be able to invest in better production methods, and their level of professionalism and organization means they are more easily reached by targeted extension services such as training to further professionalize

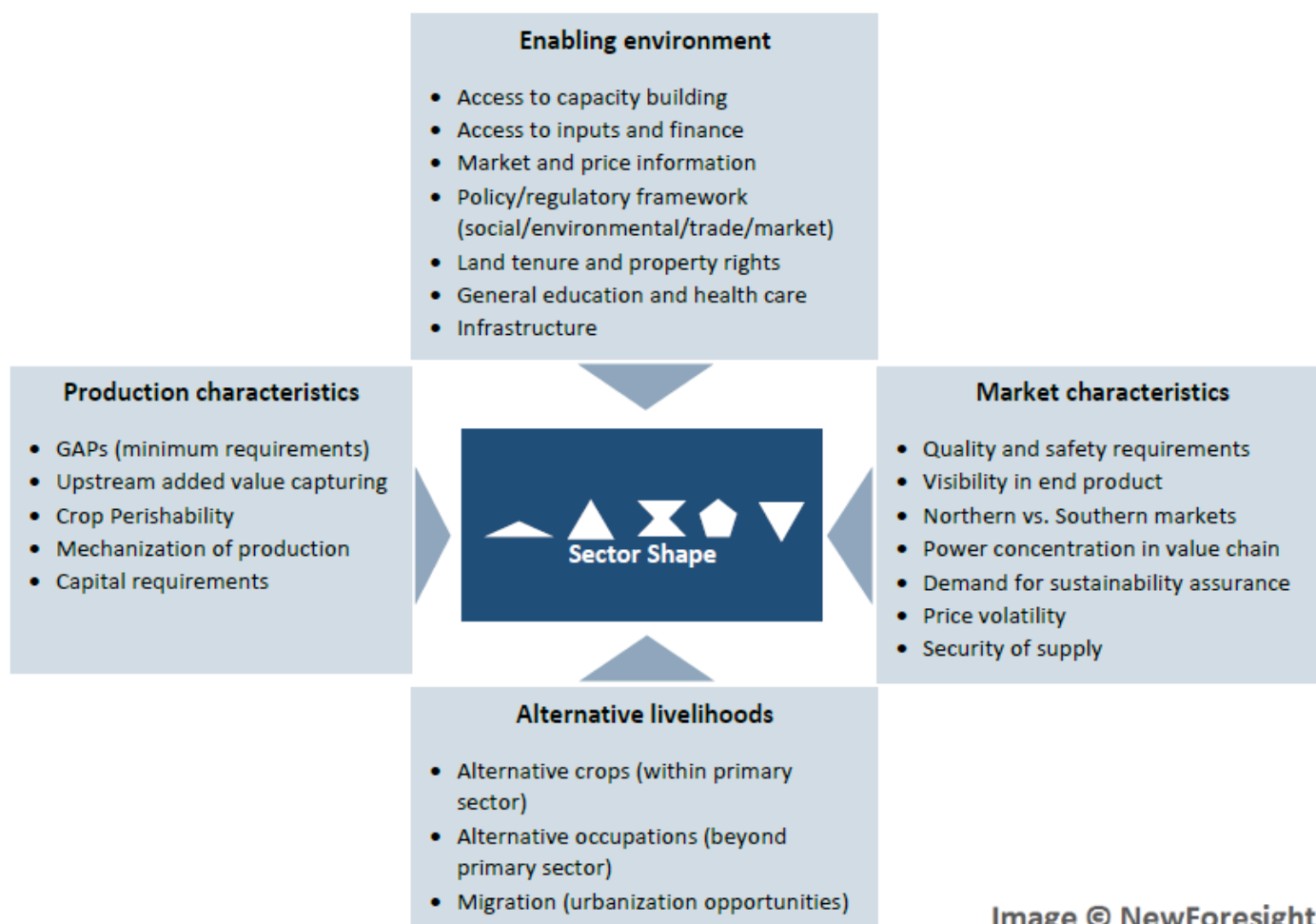
the management of their farms. Organized producers in diamond-shaped sectors adopt more efficient farming techniques, and abide by quality differentiators such as sustainability standards to increase profit. In our experience, this puts them in a good position to be at the forefront of reshaping a failing sector from within, and to take the first step towards sustainable sector transformation.

Recognizing the shape of a sector helps you to identify which sectors might be particularly 'ripe' for sustainable transformation, while also explaining why in other sectors, sustainability efforts fail to make much of a headway, or fail to structurally alter the sector dynamics in the long run. However, the shape of a sector is just one piece of the puzzle. Understanding structural change requires an appreciation of the forces which affect actors in the sector and

thus result in a certain shape, and which determine both the barriers to structural change—as well as the opportunities for unlocking it.

### 4. The Forces Model

The 'Shapes model' has shed insight into the environment that determines how producers in a sector survive—whether by competing on poverty, on efficiency and scale, or on quality characteristics. But what determines the shape of a sector to begin with? What causes a sector to be shaped like a pyramid or diamond? Which forces drive scale, professional producers, responsible production, and which drive or inhibit improvements in efficiency and the level of organization in a sector? The 'Forces model' provides a framework that helps answer these questions. The interplay among a series of forces determines the shape of an agricultural sector in a country. To



foster enhanced understanding and holistic thinking, we have systematized the variety of forces into four major categories: the production characteristics of a crop, the market for it (including internal and global market conditions), the lack or presence of alternative livelihoods for producers. The fourth force, which is potentially the most relevant, is the enabling environment; a set of interrelated legal, organizational, economic, and political conditions, which impact the capacity of individual producers to engage in a productive and viable economic activity that accords with the principles of sustainable development (see Figure 3). We will address each force in more detail, starting with the production characteristics of a crop.

## 4.1 Production characteristics

Production characteristics refer to what it takes to be a (successful) producer, and what the barriers to entry are. These questions are important because crop requirements directly influence operations on the farm and the required level of professionalism. For many food crops produced by smallholders, including staple foods, coffee, and cocoa, few skills are required to be a producer. Moreover, the barriers to entering its production are relatively low. However, due to a lack of inputs and training (both of agricultural and business practices) the productivity and resulting income level of the, mostly low-skilled, producers in many developing countries continues to fall below the poverty line. On the end, more luxury crops such as cut flowers generally require a higher level of training, storage techniques—to be successful. These crops require inputs, capital, production, harvesting and post-harvest handling, or even mechanization, and are subsequently only within reach of more

Figure 3: The Four Forces that shape agricultural sectors

professionalized or organized producers.

## 4.2 Market characteristics

The forces of supply and demand profoundly impact the shape of a sector. The market for agricultural commodities is characterized by low prices, since raw materials cannot be differentiated, but also because their supply is very inelastic in the short term. As such, the default situation for producers in developing countries is that they are price-takers with very little bargaining power. Any characteristic that differentiates a crop is a positive force on the shape of a sector as it has the ability to raise the price of the product, and with it the bargaining position of the producer and their income. The demand for quality, for instance due to health and safety requirements, or due to higher visibility in the end product, normally leads to a higher level of professionalization in the sector, as this requires capital, extension services, and often assurance, such as certification. The balance between production for quality-rewarding markets and non-differentiating markets can thus be an important factor in determining the way a sector operates in a particular country.

While the low prices of commodities are to a large extent a function of their undifferentiated nature, power concentration along the value chain can impose additional downward pressure on prices. If retailers, manufacturers, processors, and traders are vertically or horizontally concentrated, they can impact world market price of commodities and depress the farm-gate price.<sup>viii</sup> Asymmetry in bargaining position also emerges when local traders or buyers abuse their market power vis-à-vis producers—and producers are not sufficiently organized to resist.

## 4.3 Alternative livelihoods

If alternative livelihoods (e.g. farming other crops, agricultural labor, or non-

farming occupations) are unavailable, producers—particularly in impoverished sectors—are trapped in their occupation and forced to compete on low prices, often leading to incomes at or below the poverty line. This can lead to an oversupply of low-cost products, and undercut the otherwise legitimate efforts to raise productivity and income for producers.<sup>ix</sup>

The profitability of producing a specific crop varies over time and from country to country. If crop earnings fail for too long, a producer might decide to start cultivating another crop. There is a delicate balance to strike between oversupply of cheap labor in the sector and its ability to withstand supply shocks with less producers. If too many producers suddenly shift to alternative crops or professions, the sector's diminishing production capacity can create distress in the food supply and aggravate food insecurity on global level.

## 4.4 The enabling environment

The enabling environment comprises institutions, policies, laws, regulations, and infrastructure that influence value chain actors. Governments, civil society organizations, financial institutions and other actors all contribute to building the enabling environment. The threats that production and market forces pose to sustainable sector transformation could be offset if an effective enabling environment is put in place. Why? Because smallholder producers simply cannot afford to invest in their farms, or lack the knowledge, and are exposed to considerable risks from weather, pests, lack of crucial inputs, price fluctuations, lack of secure land ownership, and disadvantaged power position, to name a few. The provision of access to capacity-building, inputs and finance, considerably improves the ability of the sector as a whole to professionalize, organize, grow and invest in productivity and

sustainability. Furthermore, a sound regulatory framework can guarantee that social, economic and environmental norms for production and working conditions are in place. Last but not least, basic infrastructure (roads, hospitals, schools, transportation systems) remains an essential prerequisite for any producer to operate a functional business, and retain reliable access to markets.

The enabling environment in a country is largely created by government policies, but governments can also sabotage a previously-favorable environment by instituting counterproductive policies. Tariffs and subsidies can depress agricultural prices<sup>x</sup>, while the dismantlement of government assistance programs might leave poor and unprofessional producers without the provision of key inputs or services<sup>xi</sup>, leading to food imports dependence and further impoverishment.<sup>xii</sup>

## 5. Connecting the Shapes & Forces Models

Each sector shape is typically the outcome of a specific combination and relative significance of the forces, as follows. A flat pyramid is commonly the result of: low requirements for crop production, a high level of commoditization and low demand for quality by the market, a poorly functioning enabling environment, and the absence of alternative livelihoods. This combination of forces leads to competition on poverty and perpetuates a flat pyramid sector shape.

The hybrid hourglass sector has similar characteristics to the flat pyramid when it comes to the limited enabling environment and limited opportunities for market differentiation. Certain product characteristics, however, enable large farms to enter the sector because of

their ability to invest in mechanization, GAPs and scale. The absence of a supportive enabling environment and market demand for quality differentiation makes it impossible for medium-scale farms to survive. Hence, efficient estates compete, with smallholders hanging on by very small margins.

The inverted pyramid is a sector that consists mostly of large-scale estate farms with monocultures. Their farming tends to be highly mechanized and the enabling environment supports high economic performance, but not necessarily in a sustainable manner. Low demand for crop differentiation further drives producers to optimize productivity, often producing negative externalities in the process. If production allows for large-scale mechanization, this generally leads to more pressure on lower prices. Increasing capital requirements of mechanization force underperforming producers to either sell their operations, or go bankrupt.

The diamond sector represents a sector where product quality characteristics and market differentiation are common, and drive producer professionalism. The demand for variation in product quality can sometimes prevent the sector from being taken over by large-scale estates. The enabling environment is often supportive in this type of sector and there is ample opportunity for alternative crops or forms of employment.

As the forces shaping a sector are also the ones that can change it, sustainability strategies need to target these four forces and the dynamics they create. While production characteristics are largely inherent to

a crop, the opposite holds for a sector's enabling environment and market conditions. To alter sector dynamics in the direction of large-scale uptake of sustainable practices, intervention strategies need to aim at professionalizing and organizing producers to ensure they are able to provide a living income for themselves. However, it is intuitive that better organization on itself would not suffice, as the four forces operate in a complex interaction and are mutually reinforcing. Only targeting one does not lead to overall structural change, because unaddressed forces in the system will soon return it to its original state. A structural approach recognizes that to operate as successful businesses, producers need education, access to inputs, knowledge and finance, and a supportive government to provide infrastructure, a supporting legal framework, incentives for responsible production, and alternative livelihoods—i.e. all four forces contribute to the dynamic in the sector.<sup>xiii</sup> Each of the five different shapes we have discussed exhibits different forces and dynamics, which means any strategy to change a sector for the better requires an understanding of the interplay of forces in their entirety.

**“...intervention strategies need to aim at professionalizing and organizing producers to ensure they are able to provide a living income for themselves.”**

## 6. Conclusion

The transition towards sustainable agricultural sectors can only be successful if initiatives take a systemic, outcome-focused approach to affecting and redesigning the broader forces which shape a sector. To understand which forces shape our way to sustainability, as a sustainability practitioner you can leverage our 'Shapes & Forces' model by distinguishing the level of professionalization in agricultural sectors as a function of the intricate and complex interaction between the broader economic, political, legal and organizational forces that affect producers. The model helps change agents devise successful strategies to achieve sustainability in a sector by showing how commodity markets are shaped and affected by a complex dynamic of forces. Understanding these dynamics is the first step to tailoring solutions to the specific circumstances of producers—solutions which respond to the actual institutional, economic and ecological challenges that producers face daily.

There is no one-size-fits-all solution to a sector's ailments, and strategies have to account for the dynamic relationship between the four forces, and identify the barriers and opportunities that work for the particular sector at hand. In composition, the 'Shapes & Forces' model illustrates the interdependent nature of these forces, and thus the limitations of any approach to sustainability that seeks 'partial' or local solutions, which only address part of the problem. The model is an insightful tool that enables you to think holistically about complex change in unsustainable agro-commodity production, and reminds the reader to take into account the broader forces of unsustainability when devising any efforts for positive change in a sector.

## 7. The way forward

This article has offered a focused overview of the sector shapes and forces. It has provided implications of this model for thinking about sustainability in an unsustainable agro-food system and for understanding both the opportunities and the barriers to sustainable change. Yet we must not lose sight of the bigger picture: while the economic characteristics and regulatory environment of a sector are amongst the main drivers of (un)sustainability in the world, the factors that increasingly influence our agro-food systems are the compound result of the already accumulated externalities from unsustainable agriculture, like climate shocks and the loss of natural landscape and biodiversity.

Most of all, the structural change we need to make towards sustainability needs to come to terms with the physical limits to the resources we depend on to feed our planet. With this, we also want to call upon initiatives to work on several different axes to impact systemic change: from better organized and educated producers operating in supportive environment, through efforts to stabilize the ecosystem and our stressed landscapes, to finally raising awareness of the far-reaching implications of our daily food choices—these are all necessary and vital means to enable the transition to sustainable food systems.

### More tools by NewForesight:

Would you like to know more? The Shapes & Forces model is a useful thinking tool. In isolation, this approach is useful to understand how a complex system leads to a certain outcome, and what may be the enablers of change. However, it is designed to work within a larger set of frameworks, approaches, and concepts, which are covered in our other articles, including:

- [The brutal facts of sustainability | What do we need to change?](#) The organization of our global food systems, combined with the falling biodiversity and resilience of our natural landscapes, relentlessly leads us to the four 'brutal facts' threatening both people and planet;
- [Driving the transition towards sustainability | The four phases of market transformation.](#) By identifying the distinctive phases of market transformation, we can understand what are the key dynamics dominating a given sector, and what approaches and alliances will help kick-start the development to the next stage of sustainability.



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<sup>ii</sup> NCFH, 'Child Labor in Agriculture', National Center for Farmworker Health. Farmworker Health Factsheets. (2012) [http://www.ncfh.org/uploads/3/8/6/8/38685499/fs-child\\_labor.pdf](http://www.ncfh.org/uploads/3/8/6/8/38685499/fs-child_labor.pdf)

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<sup>v</sup> Food and Agricultural Organization, The State of Food and Agriculture 2014, In Brief, (2014): 4; Accessed August 8, 2017. <http://www.fao.org/3/a-i4036e.pdf>

<sup>vi</sup> NewForesight, "Sustainable Intensification at Scale: A Framework for Strategy Design", 2013.

<sup>vii</sup> The better economic performance at higher level of organization for our model does not contradict the commonly observed 'inverse productivity paradox'— i.e. the inverse relationship between farm size and output. We recognize that although smaller farms tend to have higher yields than larger farms within the same country, cross-country comparisons show that yields per hectare are much lower in poorer countries (where small farmers are more prevalent) than in richer countries, and could be increased if existing technologies and management practices were appropriately adapted and more widely adopted in low-

income countries. For further discussion on this, please see Food and Agricultural Organization, The State of Food and Agriculture 2014, In Brief, (2014): 4; Accessed August 8, 2017. <http://www.fao.org/3/a-i4036e.pdf>

<sup>viii</sup> Roehlano M. Briones I Manitra A. Rakotoarisoa, FAO Commodity and Trade Policy Research Working Paper No. 38, "Investigating the Structures of Agricultural Trade Industry in Developing Countries (2013) <http://www.fao.org/3/a-ar706e.pdf>; Accessed August 8, 2017.

<sup>ix</sup> Placeholder

<sup>x</sup> Simons, Lucas (2014) *Changing the Food Game*, Sheffield: Greenleaf Publishing, 2015.40.

<sup>xi</sup> Brigman, David (ed.) (*Globalization and the Developing countries: Emerging strategies for rural development and poverty alleviation*, CABI publishing, 2002. 27-83.

<sup>xii</sup> *Ibid.* 27-83.

<sup>xiii</sup> Simons, Lucas (2014) *Changing the Food Game*, Sheffield: Greenleaf Publishing, 2015. 46-47.