Transformative horizons: reflecting on a decade of scenario-guided policy formulation

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Abstract

Participatory foresight has proliferated rapidly in response to unprecedented global uncertainty and the need to transform to more sustainable societies. However, the link from foresight to action is often under-researched; and understanding how foresight can be used for the realization of transformative ambitions has proven particularly difficult. In this paper, we reflect on a unique case: a project that spans eleven years of scenario-guided participatory policy formulation processes for food security and agriculture under climate change across seven global regions. Many of the policy formulation processes in these regions have led to changed policies and plans as a result of participatory scenario analysis. The length, scope, and level of policy engagement that characterizes this case offers unique opportunities for learning about impactful foresight. In addition, lessons from the project have proliferated into a range of other initiatives that have often been able to complement the original project strategies with new approaches that have in turn yielded more insights. We provide core insights from the successes and failures in this unique global case for connecting foresight to action by examining interactions between 1) institutional contexts and knowledge systems; 2) relationships with the future; 3) imaginaries; 4) participation cultures; 5) process designs and participants; and 6) futures methodology. We then go on to discuss how such best practices can be 'scaled deep'; 'scaled out'; and 'scaled up' for transformative change.

1. **Introduction**

There is an urgent need for action in the face of global inequalities in food security in a context of unprecedented climate change (Steffen, 2015). Among many political, economic and material factors that contribute to inaction, societies struggle to imagine actionable futures beyond present conditions and ideologies. This has been characterized as the 'crisis of the imagination' (Ghosh, 2018). Foresight practices have blossomed in a thousand different forms as a response to engage imaginatively - in more reactive, adaptive or transformative modes - with the challenges of this uncertain time (Muiderman et al., 2020).

However, there is still a relative lack of understanding of how foresight relates to different forms of present day action and decision making. A strong example that responds to this gap is the NESTA (Ramos et al., 2019) project, which offers a collection of examples from different specific projects and cases. Another example is the work coming out of and related to the case discussed in this paper - the Scenarios Project of the CGIAR Climate Change, Agriculture and Food Security Programme. This project has run for 11 years and has engaged with more than 30 countries in 7 global regions, and through its focus on policy engagement and its wide range of cases and spinoff projects it has allowed for unique opportunities to investigate foresight-based policy engagement. As we will see, it has led to a diverse set of contributions to the foresight literature across very different levels of analysis, from methodology to the role of institutional contexts and global imaginaries.

In this paper, we seek to synthesize and integrate these contributions into coherent insights. We have the benefit of taking a full-project approach, looking across 11 years of practice and many applications of foresight in different contexts.

We ask the following connected questions:

1. What can we learn in terms of proven best practices for connecting foresight to (policy) action?
2. What fundamental changes and new directions are needed to support transformative foresight?
3. How can foresight-guided work be connected to (policy) action at scale?

2. Theoretical background

Foresight and anticipatory governance

Recent work has sought to bring together the worlds of foresight and futures research on the one hand and sustainability governance on the other, using the framing of 'anticipatory governance' (Guston, 2014). Anticipatory governance can be defined as governance processes that seek to engage with uncertain futures in order to steer action in the present (Vervoort and Gupta, 2018). This bringing together of foresight/futures and sustainability governance is a crucial theoretical and practical direction for development agriculture – since there is a strong need to understand how foresight actually impacts action in the present. This question is all the more important when considering that transformative change is sought in development contexts – radical shifts are needed to ensure better futures under climate change (Herrero et al., 2021). The CCAFS Scenarios Project has been supported in this regard by the Re-imagine research project which has investigated anticipatory governance processes inside and outside of the CCAFS remit across different global regions. As a result, the two projects and other connected researchers have been able to characterize a number of factors that can be seen as shaping anticipatory governance. We draw primarily on the categorizations by Hebinck et al. (2018) and Mangnus et al (2022b) for the factors below, while integrating new factors considered important

Factor 1: Institutional context and knowledge systems

Institutional contexts and the architectures of knowledge systems strongly determine what is possible in terms of what futures can be imagined. The overall funding requirements and goals of organizations that support foresight shape its potential future horizons (Dinesh et al., 2021). Furthermore, institutional contexts in terms of policy environments that are engaged with greatly shape foresight aimed at impact (Hebinck et al., 2018). Moreover, the power dynamics between various societal actors make different futures more or less accepted, plausible, et cetera., and as we will see, partners involved in foresight also bring their own framings. Dinesh et al. (2021) have analysed, for the CCAFS contexts, how science-policy engagement is shaped by institutions and knowledge systems at several different levels. Hebinck et al. (2018) focus on CCAFS Scenarios cases to emphasize that institutional mandate, support and freedom are important for foresight processes to be impactful. Mangnus et al (2021) further develop these framings outside of the CCAFS context to investigate the institutional contexts of foresight across different cities using similar methods, and highlight the shaping power of such contexts.

Factor 2: Fundamental assumptions about the future

Re-imagine researchers Muiderman et al. (2020) have analyzed different research communities to come to a typology of different approaches to the future, how it impacts the present, and what the overall goals of the foresight process might be considered to be. They characterize four approaches: 1) an approach focused on prediction and risk mitigation, in the service of planning; 2) an approach focused on deep uncertainty and plausible futures, in the service of building capacities to navigate these uncertain futures; 3) an approach focused on the political plurality of different futures, in the service of mobilizing political action toward sustainability transformations; and 4) an approach focused on the fundamental ways in

which societies enact different future imaginaries, in the service of democratizing what futures are possible to consider. Mangnus et al. (2021) build on these insights to highlight that there is a need for reflexivity around assumptions about the future as a core element of futures literacy.

Factor 3: Imaginaries

An important stream of research has focused on the notion of 'imaginaries' (collectively held, institutionally embedded visions of the future) as a key concept to help understand how societies enact different images and stories of the future collectively by reproducing and performing them in many different ways (Milkoreit, 2017). This work points at the need to challenge existing imaginaries, to extend them, and to contribute to and grow new imaginaries that allow for transformative imaginations and action in the present. Within the CCAFS project, Rutting et al. (Forthcoming) have used the notion of imaginaries to analyse the diversity of CCAFS scenario processes across all global regions – showing a relative dominance of global development imaginaries that needed to be challenged by more regional imaginaries.

Factor 4: Participation cultures

Different cultural contexts in terms of participation and foresight shape what is possible with anticipatory processes. Mangnus et al. (2022b) analyse this factor among other factors presented here across four different international cities – and show that different participation cultures and levels of experience with foresight and strategic planning can make a significant difference in terms of how important the limitations and possibilities of other factors in this framework tend to be. Different levels of experience with different formats of participation also offer possibilities in terms of what space there still might be for novel approaches.

Factor 5: Process design

Vervoort et al. (2014) discuss the importance of flexible and policy-focused process design for anticipatory processes. Foresight work can be fully integrated and timed to be of maximum use for policy formulation, in a way that is a result of close and continual collaboration with policy makers and other societal actors – and this process design will make a significant difference on the impact of the work. Of course, other factors clearly interact with this kind of policy-focuses process design – such as institutional mandate, existing knowledge systems, and more. On the other hand, careful process design can also shift and help shape institutional and systemic conditions to help prepare the ground for the foresight work. Work by Oomen et al. (2021) emphasizes the need to consider foresight and futures work as integrated futuring practices and to consider the performativity of futures work as a whole.

Factor 6: Organizing team

Positionality is a key factor to consider in foresight processes, as in all participatory governance processes. Foresight practitioners need to be reflexive politically about their own commitments regarding the future, and where these come from (Stirling, 2014) – or risk having major blind spots in terms of what futures can be imagined and how they impact the present. This relates strongly to the factor 'perspectives on the future' – but also to all other factors. More concretely, the capacities of the team, where they are located, how accessible they are to others, and, as we will see, the length of time they are able to/funded to be involved in a project, are key.

Factor 7. Participants

Participants are, of course, clearly centrally important in participatory foresight processes. Not only – who is selected to participate, but also – who gets to frame the process? How are power dynamics between participants engaged with? What mandate do participants have in a given process? Which participants should enter the process at what stage (Hebinck et al., 2018)? For instance, there are different potential roles for more technical policy staff compared to the most senior policy makers in a process, since these latter often act as mandate providers but don't have to be involved in the technical details necessarily. Political reflexivity about participation is important (Stirling, 2006, 2014). Furthermore, what mandate does the process itself lend to participants? Which participants are empowered in which ways? All these questions should be considered.

Factor 8. Futures methodology

Finally, what methods are used in the foresight process shapes what futures can be imagined and how they can be used, and this is perhaps rather obvious (Low and Schäfer, 2019). However, as much as it may seem like the other factors described in this paper would precede questions of methodology, there are also important reverse dynamics – certain types of foresight attract entirely different partnerships, mobilize different knowledge systems, generate different institutional mandates, and so on. For instance, Integrated Assessment Modelling (Pereira et al., 2021) enables the engagement with an entirely different framing of all the other factors described above than, for instance, a massively multiplayer, location-based futures game that can be played by thousands of people on the street at the same time (Mangnus et al., 2022a). Embodied and experiential methods draw the attention of different types of societal actors compared to classic scenario approaches, and so on. So, the power of certain methods to frame their contexts, if they are presented and wielded well (or badly) should be recognized.

3. Case

3.1 The CCAFS Scenarios Project as a long-running multi-regional case

The CGIAR (from the original name 'Consultative Group on International Agricultural Research) is the world's largest agriculture for development research organization, funded by governments, private foundations like the Bill and Melinda Gates foundation and the World Bank. The CGIAR consists of a set of international research centres that each engage with different research and development domains (such as specific crops or types of agricultural systems). Within the CGIAR, the Climate Change, Agriculture and Food Security program was started in 2009, initially as a smaller research program of 7 million per year – but this program became quickly integrated in larger efforts to develop integrative programs across the different CGIAR centres, significantly expanding the budget of the CCAFS program to around 60 million per year.

One of the components of the CCAFS program was a focus on future scenarios, originally as a way to engage stakeholders in structured thinking about future uncertainties around climate, agriculture and food. At its inception in 2010, the scenarios project was rooted in the research of Ericksen (2009) around food systems, and had a strong interest in engaging with drivers of change at the level of the global region – a level of analysis also identified by Ingram (Ingram et al., 2010). As we will see, the project later engaged primarily with national policy processes – but the regional scenarios were always used as an overall

framing. The CCAFS Scenarios Project initially focused only on East Africa (Ethiopia, Kenya, Uganda, Tanzania, Rwanda) as a region, but soon expanded to West Africa (Senegal, Burkina Faso, Niger, Mali and Ghana) and South Asia (Sri Lanka, Nepal, Bangladesh, India and Pakistan). From 2013 on, the Scenarios Project also included Southeast Asia (Cambodia, Laos, Vietnam), the Andes (Peru, Bolivia, Colombia, Chile); Central America (El Salvador, Nicaragua, Guatemala, Honduras, Costa Rica); and the 22 countries of the South Pacific Community. Over the course of the project, around 300 partner organizations were involved, including funded collaborations with global partners such as UN organizations (UN Environment Program, UN Food and Agriculture Organization) and international NGOs such as Oxfam GB. The project originally involved a Project Leader and a Scenarios Officer, but later expanded to a team of regional coordinators for each of the regions to ensure greater regional integration.

3.2 Five phases of project evolution

We identify five phases in order to analyse the development of this project and identify key lessons for practice and theory. These phases were not pre-planned: they emerged organically as the project changed in various ways as a result of interactions across all the levels of analysis in the framework – yet they can be described in terms of their distinct dynamics across the different factors. See table 1 for an overview.

Table 1. Five phases of development in the CCAFS Scenarios Project.

	Phase 1: Regional scenarios and quantification	Phase 2: focus on national policy outcomes	Phase 3: success cases and partnerships	Phase 4: scaling out and critical analysis	Phase 5: transformative approaches
Institutional context and knowledge systems	CGIAR as a research for development organization	CGIAR pivoting toward outcome focus	Greater support for the scenarios project; strong partnerships	CCAFS focusing more on transformation and scaling	COVID pandemic, end of the CCAFS program
Imaginaries	Food systems, sustainable development	National imaginaries coming into play; greater focus on regional imaginaries	Working with different partners adds different thematic focus and therefore new imaginaries come in	More reflexivity about role of imaginaries	Bringing in transformative imaginaries
Participation cultures	Focus on general workshops	Greater diversity of participation cultures; stronger focus on action at national level	Diversity of participation cultures with greater thematic diversity	More reflexivity about participation cultures	On-line participation because of COVID
Fundamental assumptions about the future	Navigating uncertainty, but in a strong prediction context	Navigating uncertainty, but with a stronger focus on present day decision making	Some shift toward more explicitly political and transformative elements	Adding critical governance thinking into the mix	Reflexive engagement with uncertainty, transformation, and critique
Process design	Focus on narrative scenario development - multiple workshops	Speeding up scenario development to create a focus on policy engagement	Dependence on partnerships - adjusting the approach per sattelite case	Large-scale processes; more of a focus on monitoring the process	On-line processes

Organizing team	One project leader + research officer	Regional team being established	Regional team becoming experienced	Regional team members involved in critical analysis	Regional team experimenting with diverse transformative approaches
Participants	Regional organizations; CGIAR researchers; research organizations	Stronger involvement of national governments - and those interested in dialogues with national governments	Partner organizations playing a big role in participant selection and using convening power.	More critical focus on participation	Interest in bringing in global level participants, activists
Futures methodology	Two-axis scenario development; participatory regional scenarios. Shift toward multi-axis approach	Multi-axis (OLDFAR) scenarios approach; methods for policy analysis.	Refining and expanding methods for scenario adaptation and policy analysis.	Analysing science policy gaps, multiple scenario sets	Seeds, games, transformative pathways

Phase 1: Regional scenarios and quantification

Phase 1 (2010-2012) focused on developing the scenarios approach. The scenarios project was one of the originally envisioned components of the CCAFS program. At the initiation of the program, the overarching institutional and knowledge systems contexts was still more focused on research, and the emphasis on clear theory of change for outcomes and impact that emerged later in the project was not yet present. This first phase of the project can therefore be characterized as having a relative openness in terms of a lack of strong top-down pressures from the institutional context as to what the project would have to be. As a result, fundamental assumptions about the future shaped the project logic. The Scenarios Project was envisioned mainly as a way to offer regional contextualization for CCAFS research – and as a way to connect the agricultural research of the CGIAR to the earth systems science community. More generally, though the term imaginaries was not used and the language focused more on systems framings, it can be said that there was a desire to shift dominant imaginaries in the science-policy spaces relevant to the program from 'agricultural production' to more integrated food systems futures. Connected with this, there was a strong focus on the need for a regional analysis in food systems futures – since this is a level of analysis that was still under-investigated but crucial to the understanding of food system dynamics (Ingram et al., 2010). There was a strong interest in cross-level analysis from local to national to regional levels based on the scenarios. In terms of process and methodology, multiple workshops were held in the East Africa region to create two-axis-based (Wiebe et al., 2018) qualitative scenario narratives, with a wide range of researchers, policy makers, NGOs and other organizations.

The specific use case of the CCAFS scenarios was not yet so clearly defined. A major change in this phase was the inclusion of quantitative simulation modelling of the participatory scenarios. This turned out to be an important step to increase the credibility of the scenario production – at this stage, as a more research focused process, but also, as we will see later, in policy contexts.

Phase 2: focus on national policy outcomes

What can be characterized as the second phase of the CCAFS Scenarios Project (2012-2014) was inspired by an important shift in the institutional context of the project. The CGIAR as an organization is funded by development funding – and government funders were strongly pushing for a shift in the organization toward clearly identifiable large-scale outcomes. The notion of outcomes comes from Theory of Change-style evaluation (Weiss, 1997), and the development of a strong theory of change became a requirement and challenge for the CCAFS program (Thornton et al., 2017). Outcomes were going to be defined in this CCAFS theory of change as clear behavior change among the CCAFS target next users – meaning governments and powerful international organizations, best positioned to create major change in agricultural systems in the Global South. For policy and strategy-focused work this meant significant changes in policies and strategies, and shifts in investments.

For the CCAFS scenarios project, this meant that from an arguably fairly unclear institutional mandate that existed more on the research rather than the development side of the spectrum, the project went to being under significant pressure to produce outcomes. The CCAFS Scenarios team responded to this challenge by shifting its focus more toward scenario use rather than development. This step to ensure policy outcomes was, in a way, perhaps easier to make than in other projects – because scenarios can be used to evaluate and improve specific plans and policies, if those involve make this a priority and work with potential users to make it happen. There was also a shift from a regional focus to a national focus. At the national level, policies and strategies would be possible to be guided in a more focused manner, that was also more likely to have concrete impacts; since the strength of governance of many organizations operating at the level of the global region was considerably less than national governments. Existing regional scenario sets created in Phase 1 were considered to be the basis for downscaling to national scenarios to be used in specifically selected policy formulation processes. And this model was adopted in new regions (South Asia, Southeast Asia, the Andes, Central America) as well – where regional scenarios were still developed at first with participants from across the region. But now, these regional scenarios were developed as a bridge between national policy making and global scenario sets such as the Shared Socio-economic Pathways (Kriegler et al., 2012); and the workshops that were the basis for the framing of these regional scenarios now doubled as meeting sites to work out which national governments/departments might be interested to use the scenarios they had helped create – to downscale them for national policy analysis.

A greater focus on scenario use meant that intensive collaboration with national policy makers was important. This shift in process, methods and participants, coming from the shift in institutional contexts, led to a change in the scenario team as well. The team was able to secure the support for Regional Scenarios Coordinators for each of the regions – with East and West Africa falling under one role and The Andes and Central America also being coordinated by one combined position. There regional scenario coordinators were able to organize in-depth collaboration processes with policy teams to work out which plan or strategy could be supported by a participatory scenarios process; when would be the best timing for this; who should be involved; and to help develop a deeper understanding of the benefits of the process.

Phase 3: success cases and partnerships

This approach involved much reshuffling of activities and the changes in the scenarios team from one leader and an officer to a leader and a number of scenarios coordinators across the regions. It started to

pay off in terms of generating clearly identifiable outcomes. Processes in Bangladesh, Cambodia and Honduras had success in guiding and formulating national policies. This third phase (2013-2017), several partnerships with international organizations - the UN Food and Agriculture Organization; the United Nations Environment Program's World Conservation Monitoring Centre – were established. These early partnerships were concurrent with the success cases emerging, and they were not established because of the perceived success of the project. In fact, these collaborations had started before the development of the regional scenarios in Southeast Asia and in the two Latin American regions, and partly enabled the resources to make these extra regions a reality. Existing research networks together with the momentum of a need for more regionally embedded, participatory scenario work can be identified as the reasons for these productive partnerships. The work with UNEP WCMC was mostly focused on creating regional scenarios for Southeast Asia and the Andes – and the partnership allowed for the scenarios team to extend its engagement with modelling, because of the use of spatially explicit land use change modelling (Mason-D'Croz et al., 2016). The work with UN FAO focused on Southeast Asia, first on regional scenarios, and then on policy assessments across different countries in the region.

Phase 4: scaling out and critical analysis

In Phase 4 (2017-2020), as scenarios in these new regions were developed and policy engagement processes were established across all the regions by the Regional Scenarios Coordinators, the early successes with this process focused on scenarios use led to stronger insights into how foresight can impact the present – which helped create concrete examples and strong narratives that could be used to engage with new scenario use cases in other contexts. New collaborative processes focused on specific scenario use cases were set up, including with partners such as the International Fund for Agricultural Development (IFAD), with Oxfam Great Britain, and with others. Over this period of spreading scenario use cases, many changes in terms of the details of scenario use methods were experimented with and iterated upon – also between the different regions.

However, at the same time, a new element was brought into the project. So far, the research side of the CCAFS Scenarios project had mostly focused on how to do what needed to be done – outcome-focused scenario-guided policy formulation- more effectively. This means that research and research outputs from the project were very much design-oriented. What the team had long recognized as missing, however, was a more critical political science lens on the use of foresight for sustainability governance – an anticipatory governance perspective, in short. For this reason, the project leader Joost Vervoort had been engaging with the active community of sustainability-focused political and social science research in the Earth System Governance network. This network offered the theory and tools to understand futures and foresight as a political activity. Joost Vervoort worked with Earth System Governance scholar Aarti Gupta to set up a task force for the ESG network on Anticipatory Governance (Burch et al., 2019). Vervoort and Gupta also secured funding from the BNP Paribas Foundation to critically investigate foresight as a site of sustainability politics in the form of the Re-Imagine project.

The research in this project worked to take a critical perspective both on the CCAFS Scenarios Project but also on other foresight projects and processes in the CCAFS regions. The framework developed for factor 2 - fundamental assumptions about the future – emerged from this project. This framework was then used to investigate foresight work in West Africa, Southeast Asia, South Asia and Central America. Preliminary analyses demonstrated that much foresight work, including that of the CCAFS Scenarios Project, had to deal with the tension between more explorative and politically reflexive possibilities with

foresight, and the desire among policy makers, researchers and others to use foresight in a prediction and risk mitigation mode. The CCAFS Scenarios Project could be characterized as being predominantly in an Approach 2 mode in the Muiderman et al. (2020) framework. This means that the work was framed as engaging with deep uncertainty in order to build capacities in the present and help decision makers navigate uncertain futures. However, this Approach 2 mode of working was easy to co-opt in the final translation to policy as being more about prediction and risk mitigation than it was originally intended to be. It was clear from these processes that while policies were improved in terms of the inclusivity of perspectives and the taking into account of longer-term concerns, it was not fully possible for any single scenarios process to change existing knowledge systems away from prediction-oriented planning.

Phase 5: transformative approaches

In the final phase of the CCAFS Scenarios Project (2019-2021), a reaction to the methodological limitations of the work so far came in the form of foresight methods that focuses more strongly on transformation pathways. A key example case of this has been the development of the Intended Nationally Determined Contributions and later the Nationally Determined Contributions for Costa Rica. Those involved in the development of the process for the INDCs and NDCs realized that prediction-oriented foresight approaches would not suffice to create transformative plans and pathways for Costa Rica. As a result, qualitative scenario methods were used instead, facilitated by the CCAFS Regional Scenarios Coordinator for Latin America, Marieke Veeger. This led to a large-scale process that helped create many sectoral plans at the same time through scenario-guided analysis.

This shift toward more transformative scenario approaches was further facilitated by the extension of the scenarios team with project co-leader Laura Pereira, who was a leading research in global environmental impact assessments for the UN Environment Programme's [Global Environment Outlook (GEO6)](#) and the [Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services](#) (IPBES). This means that the CCAFS Scenarios project engaged more closely with these global assessments. However, at the same time, there was a movement on-going in both assessment processes to create new ways to develop bottom-up scenarios and pathways. Pereira and Vervoort had both been part of a new initiative – Seeds of Good Anthropocenes (Bennett et al., 2016) for several years, where new ways to build scenarios from existing but still niche, radical local practices and innovations were being developed. This work now became part of the portfolio of tools in the CCAFS Scenarios Project as well. In conclusion, a combination of methodological shifts based on internal motivations and institutional contexts and further changes to the team contributed to this final phase.

4. Preliminary synthesis: conclusions

This version of our analysis provides a preliminary synthesis and summary of the CCAFS Scenarios Project seen through a number of phases and analytical lenses. This analysis will be further developed into a full research article, to be submitted in early 2022. In this research article, the interactions between the different factors and what lessons can be drawn from these interactions will be elaborated on further. However, in this preliminary synthesis, we come to the following conclusions. First of all, a clear internal mandate to create relevant scenario work for outcomes, while sometimes difficult to respond to, shaped the CCAFS scenarios project toward scenario-guided policy formulation. Here, continuous collaboration between researchers and governing actor was key to ensure a shared purpose, a clear mandate, and the right timing for foresight. When this continuous collaboration leads to trust and a shared agenda, possibilities for opening up futures to guide planning become clear. Under such conditions, foresight

methods can open up the future in planning beyond existing biases. And given careful guidance and monitoring, this can lead to significant changes in national planning. Successful policy guidance leads, in turn, to 'out-scaling' to similar processes and to 'up-scaling' to higher levels. However, there is often a clear need for 'scaling deep': the development of anticipatory capacities at the level of institutions. A key lesson from the project, finally, is the learning that was possible due to the combination of its duration over more than ten years and the flexibility that was afforded in terms of what the project should engage in – as long as it would lead to clear outcomes. Similarly, the political reflexivity that was brought in through the anticipatory governance project Re-imagine as a kind of 'critical twin' has been crucial as well to avoid the fate of so many foresight projects that have been under-examined in terms of their deeper political commitments, simply because this was not part of a project's purpose.

5. Acknowledgements

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