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**What Brazil Does When Nature Calls:  
Applying Situational Theory of Problem Solving for Coalition-Building for Sustainable  
Agricultural Practice for Brazilian Farmers**

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**Abstract**

Brazil initiated national actions toward sustainable farming in response to climate change. Qualitative studies were conducted using Situational Theory of Problem Solving (STOPS) to understand how farmers and stakeholders recognize problems and constraints in their solution adoption. A model practice of strategic communication is presented for the change agents in sustainable agriculture practice worldwide.

*Keywords:* Agriculture, Brazil, Coalition Building, ICLF, Situational Theory of Problem Solving, Sustainability

Amazon forests are prime safeguards for global air quality. Deforestation for expansive plantations and cattle ranches has fostered decades of debate over climate change. Concerned scientists and world citizens call for solutions. In response, Brazil has initiated national actions toward sustainable farming. Specifically, the Integrated Crop-Livestock-Forest (ICLF) was chosen in 2010 as one of seven strategies of ABC Plan (Agriculture of Low Carbon Emission).



*FARIA, Gabriel Rezende. ICLF area with crop, cattle and trees.*

Brazil has around 15 million hectares with ICLF system. Understanding connections between public constraints-problems is a crucial step toward implementing ICLF on 30 million hectares in Brazil by 2030, one of the country goals on the 17 Sustainable Development Goals (SDG). According United Nations, “The Sustainable Development Goals are the blueprint to achieve a better and more sustainable future for all. They address the global challenges we face, including those related to poverty, inequality, climate change, environmental degradation, peace and justice.” (<https://www.un.org/sustainabledevelopment/sustainable-development-goals/> , access on 7<sup>th</sup> January 2020).

The Integrated Crop-Livestock-Forest (ICLF) is a key innovation that can optimize land usage and reduce pressure to open new land for production. In its implementation, Embrapa and the ICLF Network Association, a public-private partnership formed by Bradesco, Ceptis, Cocamar, Embrapa, John Deere, Premix, Soesp and Syngenta, have chosen the Situational Theory of Problem Solving (STOPS, Kim & Grunig, 2011) to define and identify strategic publics and to develop counteractions to understand and help farmers. Specifically, STOPS helps

the consortium understanding how farmers and stakeholders recognize problems and perceive constraints in their adoption of ICLF.

*Need for Identifying Strategic Publics in Coalition-Building for Sustainable Agricultural Practice*

The situational theory of problem solving facilitates a more comprehensive conceptualization of key constituencies and actors such as active publics (Kim & Grunig, 2011). Publics come into existence as they encounter problematic situations. They may become motivated in doing something about the situations. Publics are specific, thus, for problems of their concerns. With their motivation, publics about problematic situations may develop into a collective to influence the situations. Members of a public may or may not know each other but their common perception and motivated communicative actions centering around problems could evolve into aggregations with a common goal and begin coordinating their efforts toward it (Grunig & Kim, 2017).

Identifying key publics and constituencies need to go a step further than just splitting the population in terms of demographics, such as profession, age, regions, and gender. Demographics are useful but often limited in its utility as the social categories such as age or residential areas would lump many different types of individuals. According to the situational theory, people in the same social categories are likely to perceive and behave very differently regarding a problem or issue that communicators target to influence.

If new governmental initiative for sustainable agricultural practice, (e.g., new requirement for farmhouse-caused pollution), the same policy change could be different among farmers. Specifically, for the ICLF's policy initiatives, those target farmers of similar age or residential regions could act differently. For some farmers might not recognize negative environmental consequences as problematic. Hence, they do not see any problem and motivation for learn and adopt new policy. In other cases, some farmers in the same region have recognized the problem (e.g., new pro-environmental regulation), but feel more prohibiting to adopt new procedures as they differ in training and financial resources mobilizing for the changing practice (e.g., high constraint recognition).

The situational theory of problem solving explains when people start or not in (communicative) action for the problem at hand. Figure 1 explains the theoretical variables and their causal influences in increasing or decreasing motivated problem-solving actions. In brief, individuals' cognitive or communitive actions for problematic situations are unlikely unless they realize problems at first. Even when people recognized problem as consequential to their lives (i.e., high problem recognition), if they perceive the problem as remote to their lives and/or they find severe barriers prohibiting their capacity in changing situation, they behave not related to the problem. In other words, for Brazilian strategic environmental initiatives that ICLF Network Association drive, if individual members of farmers of the policy targets could not perceive problems and connection to their lives and limited by barriers, they will not engage in any adaptive pro-environmental actions recommended by the ICLF Network.

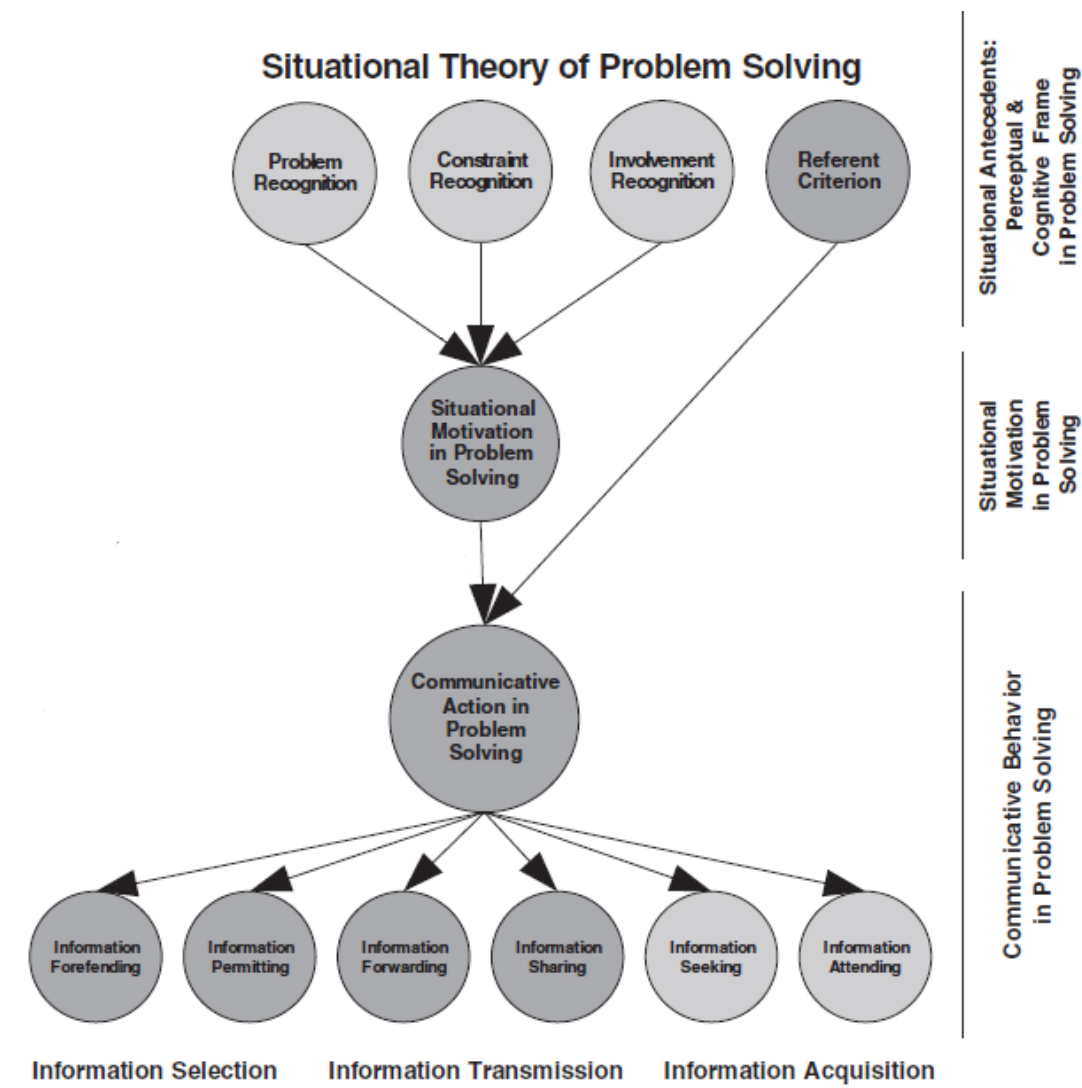


Figure 1. Situational theory of problem solving.

*The ICLF Network Association's Key Publics*

A company or a social institution that operate systematically develops a “map of strategic constituencies” or segmenting strategic publics who could influence or be influenced by process of their operation. Before deploying communicative programs and policy intervention, organization or any other communicators would be better off by understanding their communicative partners or targets – some people reserve more importance and/or some are more likely to engage with communicative efforts for the problems or initiatives of interest.

That way, communication becomes strategic as communicators reflect their pre-communication conditions and necessary knowledge on the current states and factors that influence their communication effects. Situational theory explains and help identify subpublic groups and individuals who recognize it more problematic, what could constrain and demotivate some farmers more than others. In brief, guided by the situational theory (STOPS), ICLF

Network could identify active and passive farmers related to its initiatives. Then, learn how and why some farmers become active or remain inactive among identified farmers (publics). Specifically, ICLF with identified subgroups of policy interest, they can develop a map what could challenge its efforts and what should earn more priority of intervention.

A map of publics – their different motivations, their causal factors, ICLF prepare and identify program goals and communicative objectives. Whilst ICLF's policy and program missions and goals are already clear, members of farmer publics are yet clear, if ever. The interests of ICLF should meet the farmers' interests at first. Then, the demotivating barriers are then removed or equip those constrained farmers with resources to have higher motivation and coping capacity. After all, the effective policy and communication programs could be most likely when the interest of ICLF participating members and companies meet or coorient with that of farmers simultaneously (i.e., symmetrical communication, Grunig & Kim, in press).

ICLF Network Association has these main stakeholders and strategic constituencies: farmers, technical consultants, journalists, government, decision makers and leaders, urban society, educational institutions, Embrapa internal public, ICLF Network member companies, potential associated companies, financial institutions, NGOs and industry. Because small farmers often not have the same interests unlike big farmers? Differentiation of setting communicative goals and strategies are necessary. Different subgroups of farmers could exist regarding the problem ICLF communicate. Thus, ICLF decided to check systematically the problem and perceptual and cognitive characteristics of those farmers.

The expected outcomes of this research are enhanced understanding of the ICLF communicators about what and how far there are differences between ICLF and farmers, and further among farmers themselves. Achieving joint orientation and compatible interests regarding the problems, ICLF could develop goals and objectives and estimate likely outcomes from communicative and policy efforts.

Thus, STOPS has been utilized to prepare identification of publics – how farmers view the problems, what constrained them, and what possible desires or needs they have related to problem solving, if they recognized and agreeing on the needs for actions that ICLF Network initiated. Specifically, the board of the ICLF Network Association want to know the problems and conditions related to farmers that influence the achievement of 30 million hectares with ICLF by 2030, considering the point of view from the publics and the board. After that, ICLF Network Association is able to create a quality relationship program focused on solving those problems.

### **Method: Procedures of Qualitative Study**

We conducted two phases of qualitative studies (focus group and in-depth interviews), including follow-up interviews. Qualitative research is ideal for formative research at the program level, although it also can be used for evaluation at that level (Grunig & Grunig, 2001). The focus group, held on June 4, 2019, had two directors of the Association and eight high-level representatives of each enterprise. Embrapa and the ICLF Association's field leaders identified strategic subgroups of farmers (active, aware, latent publics and nonpublic) and developed understanding of the conditions that prevent ICLF adoption. The focus was a good opportunity to understand the problems from board perspective, or Organization-Initiated PR Problem (OPR problem, Kim & Ni, 2013, Grunig & Kim, 2017).

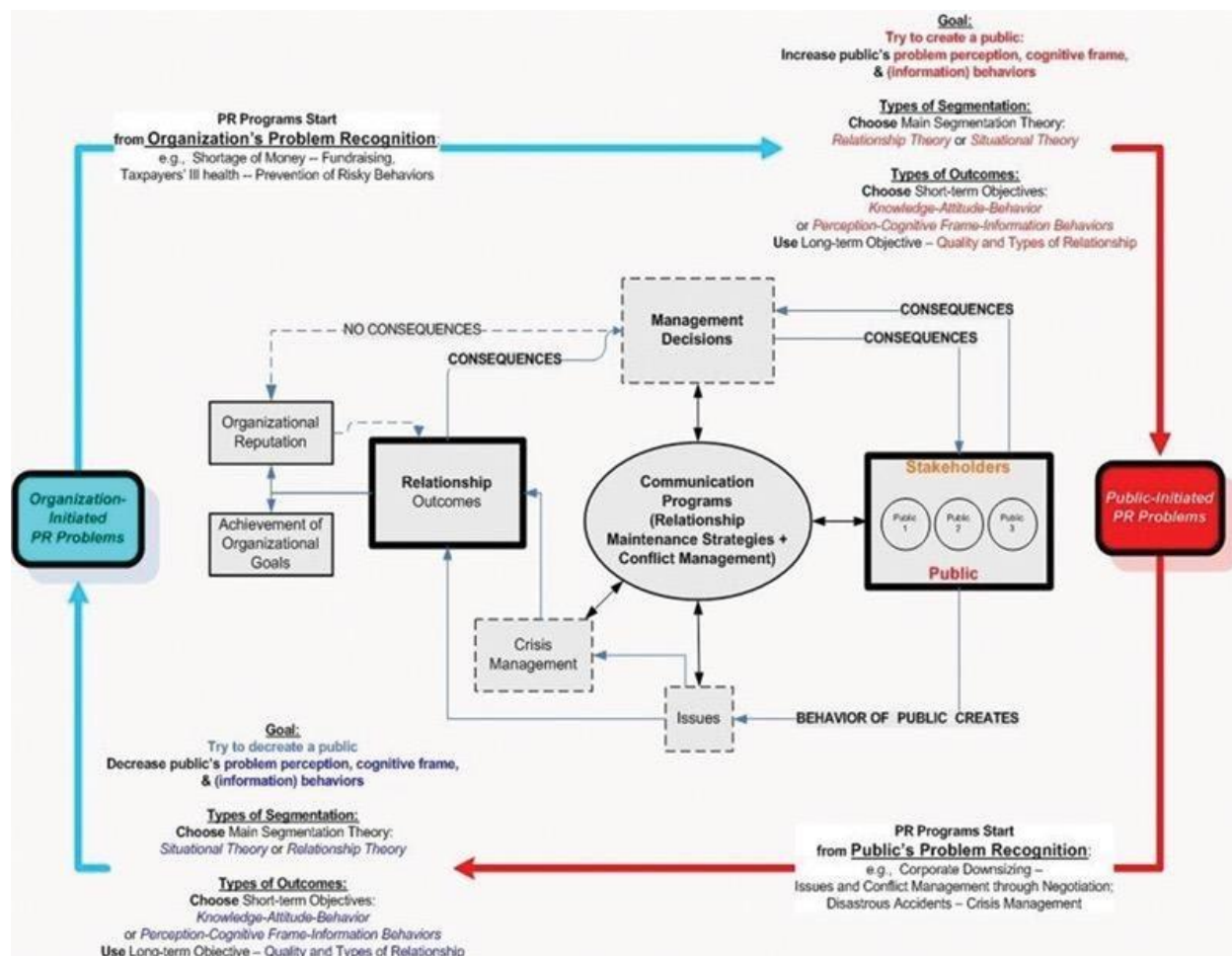


Figure 1 A taxonomy of types of PR problems in the strategic management context.

The in-depth interviews focused on four stakeholders: farmers, consultants, researchers, and college teachers. Forty-five interviews were conducted between July and September 2019, across all of the five regions of Brazil, in ten states (37% of Brazilian states): Goiás, Maranhão, Mato Grosso, Minas Gerais, Pará, Paraná, Rio Grande do Sul, Santa Catarina, São Paulo and Sergipe. In the other way, it was important to understand Public-Initiated PR Problem (PPR problem, Kim & Ni, 2013, Grunig & Kim, 2017). From the two qualitative studies, we have found 32 problems affecting the adoption of ICLF – some originating from publics and others from enterprise (ICLF Network Association). Those problems showed 11 constraints:

C: Constraint

P: Problems

OPR: Organization Initiated PR Problem

PPR: Public Initiated PR Problem

## **Results**

The findings are summarized below from the qualitative studies (focus group and in-depth interviews) using the questions and protocols guided by the situational theory of problem solving. They are:

### **C1: Lower synergy between the institutions that assemble the ICLF Network Association**

P1: Enterprises do not know why the other company is part of the Association (OPR)

P2: It is not known which actions on behalf of the ICLF the institutions carry out (OPR)

P3: Few joint actions between institutions (OPR)

### **C2: Actions taken with different audiences that sometimes do not seem to look at the Association's objectives**

P4: No prioritization of stakeholders by the ICLF Network Association (OPR)

### **C3: Only medium and large producers adopt ICLF**

P5: Lack of communication demonstrating key benefits of ICLF (OPR)

P6: Vision among ICLF farming system actors is for large producers only (PPR)

P7: Lack of knowledge of the general population about ICLF (OPR)

### **C4: The expansion of ICLF do not focus on key regions of interest**

P8: Lack of scientific knowledge about the specificities of each biome, regions and properties for the ICLF, generating lack of security for the producer (PPR)

P9: Little information about ICLF in the Northeast of Brazil (OPR)

### **C5: URTs and URTPs (technology showcase) have low effectiveness in transferring regional technology over ICLF**

P10: Low regional articulation with other institutions (universities, consultants, research companies) where URTs and URTPs are located (PPR)

P11: Existence of URTs with different physical structures (OPR)

P12: Existence of URTs that do not reflect reality in the field (OPR)

### **C6: Low use of ICLF to recover degraded pasture areas**

P13: Cultural difficulty for farmer to plant grain and forest (PPR)

### **C7: Low participation of technicians as main disseminators of ICLF**

P14: Lack of definition of technical coefficient, which must be set for technicians in order to transfer information that producers need (PPR)

P15: Lack of training of technicians in the whole production system, which generally understand either livestock or agriculture or forestry (PPR)



P16: Due to lack of technicians' knowledge, some properties adopt ICLF without customization, preventing the best results from being obtained (PPR)

P17: Few universities in Brazil teach ICLF in agronomic, veterinary or zootechnical engineering courses (PPR)

P18: Lack of training courses (specialization and postgraduate) in ICLF (PPR)

### **C8: Low producer interest in adopting ICLF**

P19: Lack of market differential for agricultural production on properties that adopt ICLF (PPR)

P20: Missing of a Property Certification Seal (PPR)

P21: Lack of measurement of impacts, mainly financial (PPR)

P22: Lack of economic data (PPR)

P23: Many ICLF events take place at Embrapa areas and the producers do not believe in what they see. They need examples from real rural properties (PPR)

P24: Different structures and resources for farmers, ranchers and foresters, making it difficult to adopt all practices (PPR)

### **C9: Low use of forest in the ICLF system**

P25: Only 17% of areas with integration have a forest component, due to limitations such as the small menu of species options and the absence of market in the regions. (OPR)

P26: Many areas do not have a consolidated forest market (PPR)

P27: Research generally uses eucalyptus, which has no high benefit for sawmill (OPR)

### **C10: Difficulty to the internationalization of the ICLF**

P28: Great difficulty in internationalizing ICLF in the market. However, there is good scientific internationalization, in partnership with universities and institutions (OPR)

P29: Defining strategy and countries in which internationalization should take place (OPR)

### **C11: Low use by farmers for financing possibilities for adoption of ICLF**

P30: Lack of proximity to the government, which can prioritize ICLF as Brazil's sustainable technology and allocate specific resources for ICLF development. (OPR)

P31: Banks' lack of knowledge of specific funding lines for ICLF and project approval parameters (PPR)

P32: Difficulty to release ICLF funding lines (PPR)

*Assess and Prioritization using SUT Matrix (Severity, Urgency, and Tendency)*

From the analysis of the qualitative interviews, we further prioritize 10 problems, since is not possible to work with 32 issues, the SUT Matrix (Severity, Urgency and Tendency) was filled for all of eight companies that form ICLF Network Association. Daychoum (2011) defines it as a tool that serves to prioritize the problems and treat them. To this end, it considers the factors Gravity, Urgency and Tendency, and for each one gives a score on a scale of 1 (one) to 5 (five), in which Gravity refers to non-resolution of the problem, and indicates the impact, mainly, results, and processes that will emerge in the long term. Urgency is the variable related to the availability of time required to resolve a given situation. Finally, Tendency analyzes the trend or standard of problem evolution, reduction, or its elimination.

After multiply  $S \times U \times T$  for each problem, the lowest number represents the most important issue, and the highest one, the less important problem. This is an easy and helpful way to prioritize problems when there is data from qualitative research. The score-sheet and analyzed results are reported in Table 1 below.

<b>Problems</b>	<b>Severity</b>	<b>Urgency</b>	<b>Tendency</b>	<b>Result</b>
1- Lack of training of the technicians in the whole production system, which generally understand either livestock or agriculture or forestry	1.67	1.44	2.44	5.87
2 - Due to lack of technicians' knowledge, some properties adopt ICLF without customization, preventing the best results to be obtained	2.00	1.44	2.22	6.39
3- Lack of measurement of impacts, mainly financial	1.67	2.11	2.22	7.82
4 - Lack of a property certification seal	2.00	1.56	2.78	8.67
5- Lack of training courses (specialization and postgraduate) in ICLF	1.78	2.00	2.78	9.90
6. Lack of proximity to the government, which can prioritize ILPF as Brazil's sustainable technology and allocate specific resources for ICLF development	2.11	1.78	2.67	10.03
7- Lack of economic data	1.89	2.11	2.56	10.21
8- Difficult to release ICLF financing lines	2.00	2.11	2.44	10.30
9- Lack of market differential for agricultural production carried out in properties that adopt ICLF	2.22	2.00	2.33	10.35
10- Lack of definition of technical coefficient, which must be defined for the technician to transfer the information that the producers need	2.00	2.00	3.00	12.00

*Table 1. Applying SUT Matrix on Problems of ICLF Network Association*

From the procedure, we could further identify 10 problems of strategic priority relevant to Brazil farmers and close or coincidental with the ICLF's interest. As these problems are resolved or reduced, farmers with the particular problems are likely to be motivated or demotivated related to problems, and thus increase the adaptive problem-solving actions and communication (e.g., information seeking or information sharing) among their communities and networks of agricultural practice.

In other words, these priority problems are to set intervention goals and related to strategies and tactics currently. The identified 10 problems from the qualitative inquiry are also used to develop a larger scale public survey following the guideline of formative research (Grunig & Grunig, 2001) and Kim and Ni's (2013) communicative goals/objectives in relation to OPR and PPR problems. The anticipated survey findings will be used for the registry of communication and policy goals/objectives, and subsequently help evaluate and determine the effectiveness of the programs by ICLF Network Association.

### **Conclusion**

Understanding connections between public constraints-problems is a crucial step toward implementing ICLF on 30 million hectares in Brazil by 2030. To this end, our study shares Brazil's efforts toward sustainable agriculture and environmental repair. Our collective efforts will improve and expedite agricultural change with ICLF. Specifically, we used the public relations theory (STOPS) and its procedures to segment strategic publics, combining with SUT Matrix to prioritize problems. The research team identified real obstacles to ICLF adoption, and our team used the findings to develop policies and mobilize resources to remove identified constraints. We used the views of Brazilian farmers to encourage collaboration among farmers, government and industry. Our research and practice establish a model for governments and other consortiums that wish to be agents of change in environmental protection and sustainable agriculture practice worldwide.

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