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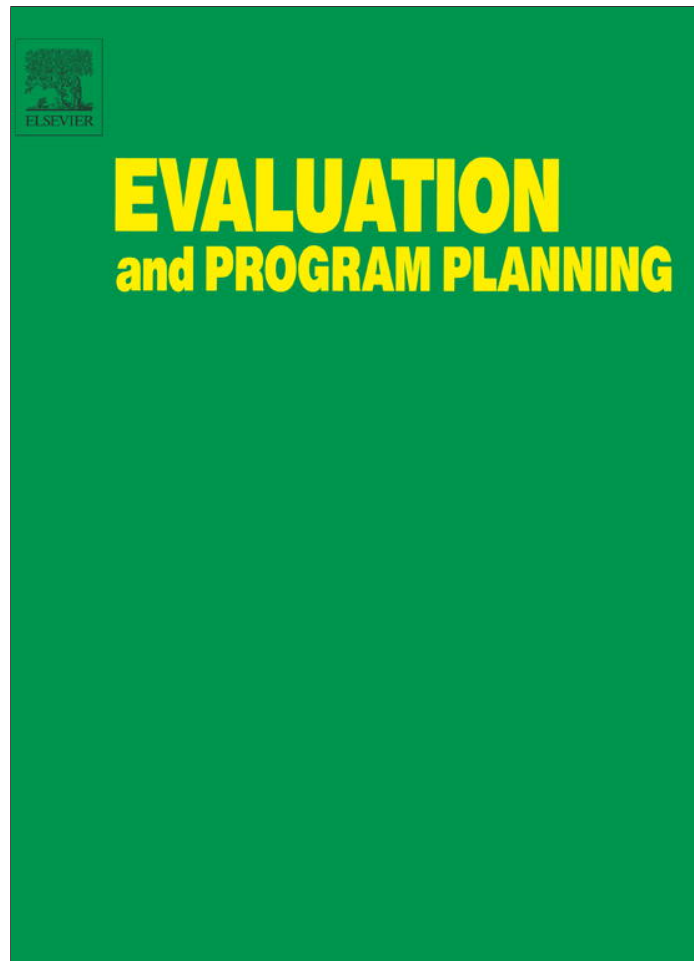
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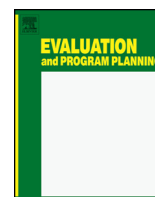
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Learning about fishery management: Evaluation of a contextualized responsive evaluation approach

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ABSTRACT

This article discusses the extent to which a responsive evaluation (RE) approach contributed to learning by stakeholders in a case of high complexity. Fishery management in Grand-Popo, Benin is characterized by ambiguity, that is contrasting views among fishery stakeholders about what should be done, why, how, where, and when to resolve fishery problems like the depletion of fish-stock and absence of income alternatives. It was also characterized by great gaps (mismatches) between interventionists' plans and actions, despite generations of interventions and evaluations of their effectiveness. The RE approach aimed at facilitating interactions between interventionists and fishing people to stimulate learning and hence reduce the ambiguity and mismatches. In this article, we take distance and evaluate the results of this action research approach. We found that in the interaction some learning indeed occurred. The fishing people learned among others that intervention resources are limited and that they should organize themselves to lobby for and monitor interventions to solve their problems. Interventionists learned that they could share knowledge about their roles and limited resources with fishing people so that the latter could lobby for more resources. Fishing people however, did not learn to adopt more sustainable fishing practices. Also, interventionists did not learn to influence politicians and financial partners themselves for sufficient resources. Both categories of stakeholders developed ideas for how to collaborate to improve fishery management. We conclude that although some single-loop, double-loop and social learning occurred, the learning was limited and reflect on the related challenges for RE in natural resource management.

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1. Introduction

Facilitating sustainable natural resource management (NRM) in developing countries remains a challenge (OECD, 2002; UNEP, 2011; United Nations, 2002, 2012; WCED, 1987). It is a challenge not because of a lack of initiatives, but because of the questionability of the initiatives that are undertaken to solve the diagnosed problems and a lack of knowledge about the mechanisms that explain the persistency of problems. Among the diagnosed causes of unsustainable NRM interventions are the lack of participation of resource dependants in intervention processes and the linear planning presuming clear intervention–effect relationships (Baland & Platteau, 1996; Dangbégnon, 1998; Holling, 1978; Stankey, Clark, & Bormann, 2005). These diagnoses led scientists

and practitioners to suggest integrative and adaptive management approaches to NRM. Cap-net, GWP, and UNDP (2005) for instance suggest integrated water resource management – a process designed to promote the co-ordinated development and management of water, land, and related resources in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems. Holling (1978) proposes adaptive environmental management; an interactive process engaging managers, scientists, resource users, and other concerned stakeholders which makes use of techniques to reduce, and benefit from environmental changes in order to develop more resilient policies. Put more simply, adaptive management is an approach in which management experiences are considered as sources of learning by managers and scientists, as well as other management stakeholders, which should lead to adaptations in the management approach (Halbert, 1993; Stankey et al., 2005; Walters, 1997). Some evidence suggests that integrated and adaptive management has contributed to the design and enforcement of fishing rules (Jentoff & McCay, 1995; Lee, 1998; McLain & Lee, 1996). This is the case for instance in

Abbreviations: NRM, natural resource management; RE, responsive evaluation.

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Norway, Denmark, and Spain, where fishermen’s organizations and the government cooperate in the design and enforcement of fishing quotas and other rules (Jentoff & McCay, 1995). In the United States and Australia, Ladson and Argent (2002) and Mapstone (2003) report on various degrees of success in the application of the adaptive management approach to rivers and fisheries management. However, they also note many problems with the adaptive management approach, such as a failure to understand the resource system, non-relevant problem definitions, lack of participation of important stakeholders, a complex web of values, and institutional complexity. In general, complexity and uncertainty in NRM are perceived as the diversity, interconnections, and dynamics of and among factors and actors connected to NRM (Baland & Platteau, 1996; Giller et al., 2008; Williams & Imam, 2006). In conclusion, the effective implementation of integrative and adaptive management approaches could generate successes, but faces challenges due to complexity and uncertainty (Lee, 1998).

In our view, gaps between what interventionists and the target groups of interventions say they (will) do and what they actually do contributes to complexity and uncertainty of NRM, among others because espoused theories in the form of plans may trigger high expectations among the beneficiaries that are not necessarily fulfilled. Effective NRM hence may well be dependent on explicit attention to match between action theories espoused and in-use (see Section 4.1 for an explanation of these concepts). To date, very few studies address this issue of (a lack of) congruency in action theories that are the assumptions underlying actions of NRM stakeholders. This article aims at filling this gap by evaluating an action research approach that was especially designed to foster correspondence in action theories by stimulating learning in the context of NRM.

The study reported in this article is one of the first about the use and results of responsive evaluation (RE) approach in the field of

NRM. Hence, it provides insight into the potential and the challenges of RE to stimulate learning in complex contexts. Such accounts of the outcomes of an evaluation approach are rare in evaluation practices (Miller, 2010).

In the following, the action research approach will be presented shortly in relation to the specific case that is at the core of this article: fishery management in Grand-Popo (Section 2). Next, the RE approach used in the case to stimulate learning is presented (Section 3). The methodology to assess whether learning has taken place is described in Section 4. Section 5 reports the action theories espoused and in-use of the fishery stakeholders before the RE process in order to define the main mismatches. The changes occurring in the RE process with regard to these mismatches are discussed in Section 6. Section 7 analyses the changes in terms of learning after which possibilities to improve RE are suggested in line with plausible reasons for the limitations in learning discussed in Section 8.

2. Fishery management problems in Grand-Popo

Grand-Popo is a municipality in South-Western Benin, next to the Atlantic Ocean. It is a Ramsar site, i.e., a wetland of international importance composed of rivers (*Mono* and *Sazué*), the coastal area, lagoons (*Grand-Popo* and *Gbagan*), a channel (*Chenal Aho*), a delta (*Bouches du Roy*), some marshlands, and some plateaus (see Fig. 1). This municipality has more than forty thousand inhabitants living predominantly from fishing, supplemented with small-scale agriculture, animal husbandry, crafts, collection of diverse natural products like crab and raffia, and trade. In the lower valley of the Mono-River, floods and river erosion impair the livelihoods of many inhabitants (more than 50%) (Appretectra, 1995; Dagnon-Prince et al., 2004; Jul-Larsen, 1994). The flooding dates back to the seventeenth century (Pliya,

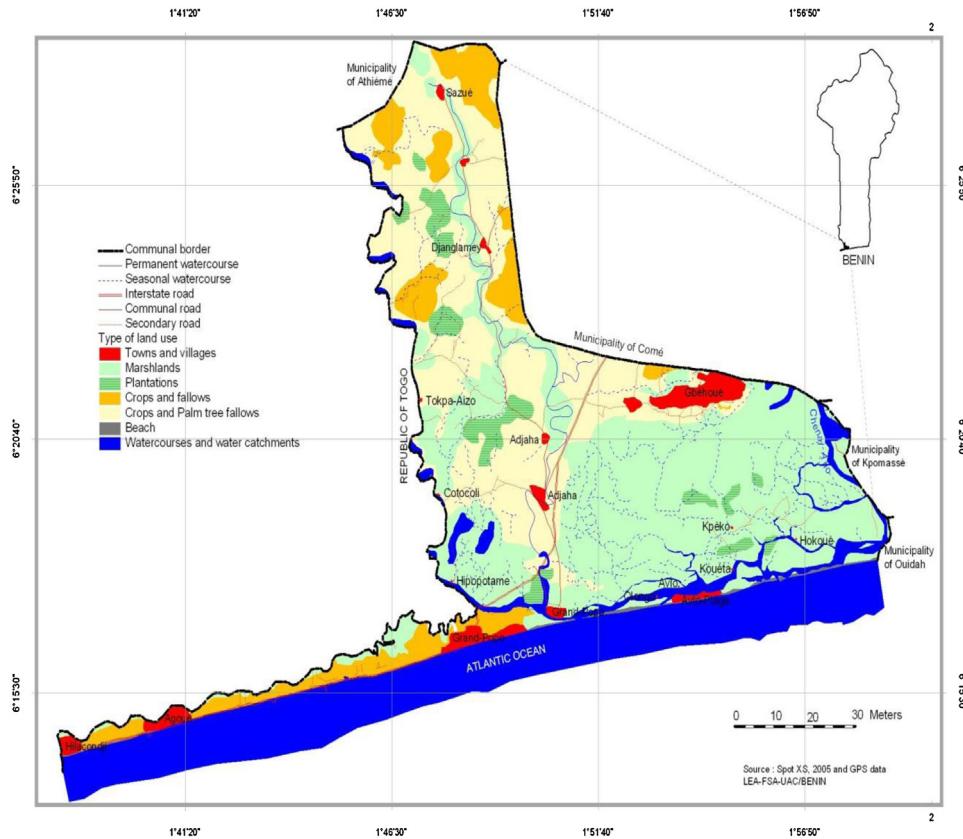


Fig. 1. Map of Grand-Popo.

1980) but has been worsened by the *Nangbeto* hydroelectricity dam built up-stream in Togo Republic in 1988 (Ouali, 1995). Indeed, the dam retains an amount of water up-stream for its functioning. In wet seasons, excess of water is released causing excess of water and flood downstream. These floods erode both coastal and continental lands; destroy crops, other income sources and houses, causing displacement of hundreds of people each year, people drowning, and an increase in water-related diseases like malaria and cholera. Other consequences include road degradation, the sweetening of the brackish water in the lagoons, the proliferation of aquatic weeds like the water hyacinth, the proliferation of hippopotamuses, the siltation of the delta, and a reduction in fish species' diversity (Gnélé, 1991; Tomety et al., 2001). Fish species' diminution is further exacerbated by the fishing communities' overfishing practices (Kouévi, Mierlo, Leeuwis, & Vodouhê, 2013; Gnélé, 1991; Pliya, 1980; Tomety et al., 2001). All these inter-linked problems have lasted for several generations.

Interventions to deal with and solve the problems thus far have consisted predominantly of income-source diversification by husbandry of rabbits or 'grasscutters', horticulture, fish farming; (re)defining regulation to prohibit fishing techniques and other practices destructive for the fishery ecosystem; and providing temporary housing, drugs, mosquito-nets, and food supports to flood victims. Research revealed that these interventions have not been very effective due to the repetitive mismatch between interventionists' espoused and in-use action theories (Kouévi, Mierlo, & Leeuwis, 2011). For example, fishing rules improved to some extent from generation to generation, but the interventionists never maintained them. Also, intervention plans became more and more integrative, but in practice, interventionists remained specific in their actions.

Additional research established that ambiguity, i.e. diverging and contrasting perspectives of the interventionists and fishing people on the causes of and the solutions to the problems also contributed to the limited effectiveness of the interventions (Kouévi et al., 2013). One of the main contrasts concerned the fact that interventionists and fishing people attributed the absence of solutions to one another.

For these reasons, we concluded that more effective interventions require learning among both categories of stakeholders, and designed an action research approach perceived suitable for the specific context. The current article reflects on the experiences and assesses whether the chosen methodology of responsive evaluation contributed to the explication of action theories, reflection on the mismatches, and changes in the action theories that is learning.

3. Stimulating learning with responsive evaluation

Responsive evaluation (RE) is a methodology that stimulates discursive interactions and learning by and among stakeholders of an intervention in case of ambiguity about what should be done, why, how, where, when, and by whom in front of a problem (Abma, 2005a, 2005b; Abma & Stake, 2001; Baur, Elteren, Nierse, & Abma, 2010; Stake, 1983, 2006). It is an approach that acknowledges power differences and recommends, dialogue facilitation and Socratic guidance for reflection. Its proposed advantages are increased inclusion of marginalized people, mutual learning, mutual understanding, and improvement in effectiveness of interventions. The performance of RE in ambiguity reduction and improvement facilitation is reported in non-routine healthcare and educational interventions around the world.

Because of the ambiguity in fishery management in Grand-Popo, RE seemed a good approach to stimulate learning. However, in our view it also needed to be adapted to some specific

characteristics of the context. To start with, fishery management in Grand-Popo was characterized by many generations of intervention programmes, instead of a single interventions. Secondly, NRM is known to be complex and uncertain due to the elusive dynamics characterizing natural resources (Baland & Platteau, 1996; Giller et al., 2008; Williams & Imam, 2006). These differences led us to design a contextualized responsive evaluation, which has been described in Kouévi et al. (2013). We added three dimensions to the existing RE framework. The first is a historical analysis to reflect on the (lack of) progress in generations of interventions, whereas RE usually deals with unique interventions. Second, the quality of learning pursued and/or reached is added for the specification of the RE goal and activities. The third dimension relates to a systemic analysis of interventions to explore the complexity and uncertainty.

The most relevant addition to the general RE methodology with regard to the evaluative aim of this article is the exploration and discussion of action theories to trigger double-loop learning as suggested by organizational learning scholars (Argyris, 1976, 1991, 2003; Argyris & Schön, 1976, 1996). In RE theory, learning is perceived as an outcome of friendly communication about ambiguous issues among stakeholders (Abma, 2005a, 2005b, 2006; Abma & Stake, 2001; Stake, 1983). In fishery management in Grand-Popo it had become obvious that not just ambiguity in the issues of different stakeholders needed to be addressed, but also the increasing gap between espoused and in-use action theories of the same stakeholder. Hence, we assumed that by explicating the stakeholder's action theories and putting them up for discussion, the stakeholders would reflect on them and hence come to double-loop learning. This is understood to take place when people change the values and goals implied in their action (Argyris & Schön, 1976, 1996), or when they redefine their roles and relationships (van Mierlo, Leeuwis, Smits, & Woolthuis, 2009), rather than single-loop learning in which goals and values remain the same and people only change the way they try to achieve their goals. In Box 1 readers find a description of the final design of RE approach as it was carried out in the period between December 2007 and February 2011.

Major activities in the RE process to stimulate learning were interviews with many actors, meetings with fishing people and interventionists separately (homogeneous group discussions) and a final meeting with both stakeholders categories (heterogeneous group meeting). In the meetings, the evaluator reported on his interpretations of the stakeholders' actions theories. In several homogeneous group meetings with fishing people, they were asked to validate these interpretations of their action theories, and to reflect in small groups on contrasts between their main issues and action theories and those of interventionists, the implications of such contrasts for effectiveness of interventions, and on how to diminish contrasts and mismatches. The same kind of meetings took place with the interventionists. In the heterogeneous group meeting the interventionists and the fishing people met to discuss important issues, ambiguity and mismatches with one another.

The evaluator's activities of asking the stakeholders to explicate their action theories and discussing them in the meetings, and giving feedback were expected to stimulate reflection on the action theories and hence stimulate learning.

4. Evaluating learning among the fishery stakeholders

Since a major validation criterion of action research is its relevance and impact in a concrete context, the aim of this article is to critically reflect on whether learning indeed has taken place. In this section we explain how we assessed whether learning among the fishery stakeholders in Grand-Popo occurred and how these changes can be attributed to the RE approach. We make clear how

Box 1. Description of RE activities (see Fig. 2)

- Exploration of issues and action theories of stakeholders: With this activity the responsive evaluator (REvaluator) was expected to go beyond issues or concerns expressed by stakeholders to generate understanding about the action theories espoused as well as those in-use.
- Historical and systemic analyses about issues and action theories espoused and in-use by stakeholders: With this activity the REvaluator deepened the understanding of issues and action theories by extending investigations to the past and to the whole context from which they (may have) emerge(d).
- Interpretation of issues and action theories with reference to history and system analyses: Here, the REvaluator generated meaning about identified issues and action theories.
- Homogeneous group meetings:
 - The REvaluator organized peer groups' meetings to let the stakeholders check his interpretations (member-check), to stimulate reflection on mismatches and to select important and shared issues to be discussed during heterogeneous group meeting.
- These peer groups' meetings aimed also to stimulate the cross discussions (cross-check) of the issues and action theories of the other stakeholder group. The idea of the cross-check is that information hidden by one stakeholder group may be provided by the other group.
- Heterogeneous group meeting: The REvaluator facilitated the discussion on ambiguity and mismatches in taken-for-granted issues and action theories among stakeholders to support them to define solutions. The intent here was to promote dialogue or discursive interaction among stakeholders, such as to stimulate them to share knowledge and to learn about one another's issues and action theories. This interaction was expected to stimulate stakeholders to arrive at more coordinated and effective actions.
- Assessment of impacts: The REvaluator analyzed whether the contextualized RE process led to desired impacts such as social inclusion, interactions, double-loop learning, and improved intervention practices.

action theories were first unfolded and then compared to identify mismatches. Changes in the sense of a diminishing of mismatches are considered as signs of learning.

4.1. Unfolding action theories of stakeholders

Before and during the RE process, the first author of this article who was also the evaluator unfolded the action theories of the two main stakeholder categories, i.e. interventionists and fishing people. Action theories are the assumptions underlying people's actions. Argyris and Schön (1976) make a distinction between two kinds of action theories: theories espoused, i.e. assumptions presented to others, and theories in-use, i.e. assumptions underlying actual practices. Since ignoring the divergence of the two inhibits learning, we paid attention to both theories for the sake of detecting mismatches (Argyris & Schön, 1976, 1996).

All the RE activities contributed to unfolding the action theories of the stakeholders: The individual interviews and the homogeneous and heterogeneous meetings (see Fig. 2). The action theories espoused were collected with interviews and via the review of documents (designs of intervention projects and programmes, and evaluations' reports of organizations). The 160 fishing people (women and men) interviewed are members of local development associations; village councils; endogenous authorities' groups;

fishing groups; fishery products processing groups; and salt production and trading groups. All these people live in the surroundings of the coastal Lagoon and of the Atlantic Ocean of Grand-Popo from which their livelihoods depend mainly. They are from six landlocked areas (islands) and marginalized fishing villages (Avlo, Avlo-Houta, Ollongo, Kpêko, Hokouè, and Kouèta). The 50 interventionists interviewed were from 17 different intervention organizations (projects, NGOs, fishery directorate, municipal, technical and financial organizations) concerned with fishery management in Grand-Popo.

The action theories in-use were generated with the help of observations, evaluation reports, and cross-checks. For several years, the practices of the interventionists and the fishing people have been studied via direct observations in the field. In addition TV and radio news, newspapers, and interventions' reports were studied with regard to concrete actions and practices. Moreover, since it is hard to uncover people's theories in-use if they do not match the espoused theories we interviewed the stakeholders about the actions and practices of the other group.

Both types of action theories were unfolded by analysing the four micro-theories that Argyris (1970) distinguishes:

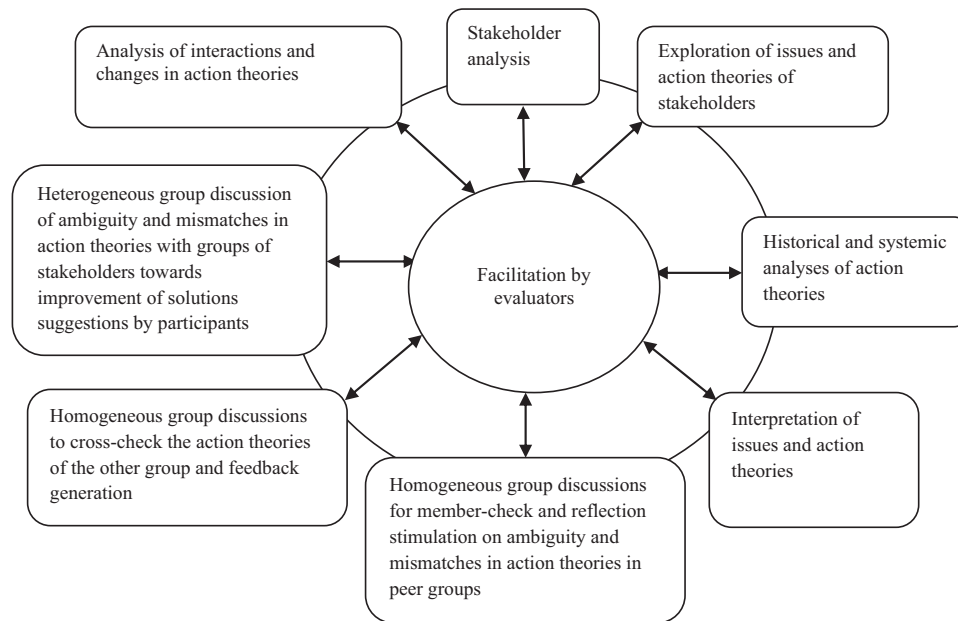
- 1) assumptions about what is done, what is being done, what to do, or what will be done generate the action taken or espoused;
- 2) assumptions about the reasons behind the action and its consequences;
- 3) assumptions about how to carry out the action for its intended goal; and
- 4) assumptions under what conditions (constraints and opportunities) the action will lead to the desired outcome.

The action theories of the stakeholders are grouped in two main categories because of the dissimilar roles fishing people and interventionists play in the problems and interventions, due to their main concerns and the resources available. The action theories reported in this article represent the general patterns derived from the analysis of the action theories.

4.2. Uncovering mismatches in action theories and assessing learning

Mismatches relate to a lack of congruence between the action theories espoused and in-use. These differences were detected by comparing the general patterns of the espoused and in-use action theories of fishing people and interventionists. The match between the action theories was first appreciated by the main researcher, and afterwards validated by the stakeholders themselves (member-check).

The data to assess the learning stimulated by the RE approach were collected during the RE activities. They consisted mainly of the reports of each RE activity: tape and video records and transcripts and notes of interviews and meetings. Data generated during the exploration of stakeholders' action theories served as a basis for determining the changes that occurred after the dialogical interactions during the homogenous and heterogeneous group discussions. The learning was analyzed by comparing the stakeholders' action theories during the individual interviews, with those during the homogeneous and heterogeneous group discussions. After uncovering the changes in action theories, they were characterized as single or double loop learning by the researcher. For the sake of member-checking, at the end of each meeting the fishing people and interventionists were asked whether they had acquired any new knowledge or developed new ideas in the meeting. This way of member-checking the learning during the meetings also helped to study how the RE approach contributed to learning.



Source: Adapted from Author et al., 2012

Fig. 2. Responsive evaluation framework for the Grand-Popo fishery context.

5. Action theories and mismatches before RE

In this section, we present the action theories of the fishery stakeholders as they were at the start of the RE process. Also, the main mismatches in the action theories of the fishery stakeholders are defined, since they are the main frame of reference to assess whether learning has taken place. We start by presenting the fishing people's action theories and then continue with those of the fishery interventionists.

5.1. Espoused theories of the fishing people

The problems pointed out by the fishing people concerned mainly the impairment of their livelihoods, which they attributed principally to fish-stock depletion. Other reasons mentioned were the absence of income-generating opportunities, floods, erosion, and the absence of socio-economic development infrastructures. In their view, fish-stock scarcity was mainly due to the siltation of rivers and lagoons and changes in the salinity of the water caused by the hydroelectric dam *Nangbéto* constructed upstream in Togo Republic in 1988. According to the fishing people, because of the dam, the previously brackish water of the lagoons downstream had been sweetened due to flooding, siltation, and the blockage of the *Bouches-du-Roy* (Grand-Popo Delta). Indeed, some fish species living in the lagoons grow in brackish waters and migrate to the sea or die when the salinity level of their living waters decreases. Fishing people also attributed the problems to the greater prevalence of hippopotamuses threatening for fishing and fish trade, the proliferation of aquatic plants in the rivers and the lagoons of Grand-Popo, and the sweetening of the water-system because of the dam. Hippopotamuses locally called "*Tomingni* (*water cows*)" are so much feared by fishing people that they refrain from shipping, fishing, and fish and salt trading in the sweet water areas where the *Tomingni* are active.

Another cause persistently and generally stressed by the fishing people related to the perceived indifference of interventionists, politicians, and powerful community members (mainly intellectuals) to their quests for solutions. Fishing people expected the causes of their problems to be removed by these powerful actors

because they were perceived to have the means and capacities needed. The fishing people perceived themselves as unable to help themselves. This feeling was expressed by one of the fishermen of *Avlo-Houta Village* as follows:

We [fishing people], here, we have no capacity to contribute to any change... We have no power. We are in the darkness... Whom can we go and see at Kpogandji [meaning Grand-Popo center where the municipal offices are located], Cotonou [economic capital of Benin] or Porto-Novo [political or administrative capital of Benin] for our problems to be solved. We don't have this action capacity. It's for powerful intellectuals, decision makers and politicians to help us if they really want us to succeed solving the problems.

Relevant activities and strategies to solve the problems should consist in the halting or control of the flood effects of the dam. In the fishing people's view, alternative income sources should be provided to all fishing actors according to the needs and specificities of each community. Some people from the *Arrondissement of Avlo* suggested, for instance, the promotion of pig farming instead of the rabbit farming promoted by one of the projects because of their historical familiarity with pig farming.

People who live close to the sea and who are threatened by siltation, coastal erosion and the migration of fish stocks towards the sea after the opening of the delta, and having difficulty crossing tidal waves, wanted the delta to be revetted with rocks to stabilize it. Most of the fishing people wanted the rulers and interventionists to dredge the rivers and lagoons mechanically for flood control, the restoration of fish reproduction shelters, and easy sailing. They also wanted socio-economic development infrastructures to be constructed in their area by interventionists and politicians in order to allow their villages and their children to "open eyes", an expression for development.

5.2. Theories in-use of fishing people

The fishing people used to wait for consultation opportunities created by interventionists and politicians to narrate their problems and propose solutions to them (see Kouévi et al.,

2011, 2013). Since there were few consultation opportunities, the fishing people used to ruminate on their problems.

Due to fish scarcity, the fishermen used to spend a lot of time, sometimes more than eight hours per day catching few fish of low economic value. Some, who were mobile, mainly young fishermen, migrated for more attractive fishing, and other jobs or income-generating activities to elsewhere in Benin or other African countries like Lomé, Cote d'Ivoire and Gabon (Association Nonvitcha, 1987; Dagnon-Prince et al., 2004; Jul-Larsen, 1994).

The other residents, like old people, women, children, and the remaining young people rarely took the initiative to tell interventionists and politicians about their problems and ideas about solutions thereto. Furthermore, they seldom initiated community-based management projects to solve their problems. Instead, they expected the interventionists to do so. Since they assumed that the interventionists had sufficient resources, the fishing people perceived the interventionists and politicians as indifferent to their problems and as liars who did not stick to their 'promises'. However, most fishing community members suggest solutions to interventionists and politicians when given the opportunity in political or diagnosis meetings, especially with regard to dredging, income-source diversification, flood control, socio-economic infrastructures, and delta revetment.

In this process of waiting for the problems to be solved one day, most of the fishing community members violated the fishing rules and persisted in practices that increased the problems such as destroying banks and mangroves. Meanwhile, banks' destruction or erosion contributes to the siltation of the water and of the delta, and hence to flooding and sweetening of the lagoons. Mangroves are also well-known to serve as source of food, and as shelter for the development and the reproduction of fishery resources. The fishing people said they continued these unsustainable management practices because of the absence of survival or income alternatives and the absence of control and punishment of fishing rules' offenders. In their view, the offenders of rules are protected on the basis of their personal relationships which is how fishing people justify their reliance on interventionists to control the fishing rules rather than do it themselves.

5.3. Mismatches in fishing people's action theories

We discovered three main mismatches in the fishing people's action theories: (1) ill-founded trust in interventionists' capacities, (2) passive response to indifference of interventionists, and (3) sticking to practices known to be unsustainable.

Despite experiencing the ineffectiveness of their strategy to get interventionists to solve the fishery problems, the fishing people continued narrating their problem definitions to interventionists and politicians when given the opportunity and continued seeing this practice as the relevant strategy to get their problems solved. They attributed the repeated ineffectiveness of the strategy to their own helplessness and kept on trusting the interventionists' capacities to solve the problems.

A second mismatch is that the fishing people continued expecting interventionists to take the initiative, although they also regarded them as being indifferent to their problems and liars. The fishing people continued relying on the interventionists to take action and solve their problems, but they did not take any initiative themselves although that would have been more congruent with their belief in the indifference of the interventionists.

The third mismatch relates to the fact that, although aware of the potential threat posed by their fishery management practices to their livelihoods, the fishing people stuck to unsustainable fishing practices. They explained the continuation of those compromising fishing and water resource management practices

by their need to survive in the absence of alternative income sources. As a fisherman from *Hokouè-village* formulated it:

We, since we were born, we have been in contact only with fishing. We know nothing about any other activity. Without an alternative, what can we do to eat?

Dredging is widely perceived by the fishing people to be the primary solution for the fishery problems instead of changing their own practices. In their view, fishery resources find relevant development and reproduction conditions in deep water, while silted water reduces these development and reproduction spaces.

5.4. Espoused theories of interventionists

The main fishery problem pointed out by the interventionists related to the impairment of fishing people's livelihoods. According to them, the causes of this central problem were that fishing people did not respect sustainable management and fishing rules, and that they themselves had limited intervention resources available to tackle these demanding problems and their underlying natural causes.

To solve this problem, interventionists expected solutions to come from the government, financial and technical partners, and from fishing people. The government and the financial and technical partners should provide them with relevant intervention resources (money for monitoring) and deterrent and sanctioning resources (radar, motorboats, police) in order to allow them promoting income-source diversification and enforcing fishing rules. With relevant resources, the interventionists expected to be able to raise fishing people's awareness about the necessity to respect fishing rules, and to monitor and sanction offenders effectively. In their view, the government, the municipal council, NGOs, and the projects could not solve all the problems of the fishing people. They expected the fishing people to act on their own initiative by proposing concrete solutions about income-source diversification and the promotion of sustainable practices instead of waiting for proposals from interventionists.

5.5. Theories in-use of interventionists

In practice, interventionists did try to raise the means they perceived necessary to solve the problems. The designers and technicians of the fishery directorate for instance had often expressed their need for resources from the budgets of the ministry and of projects to solve the fishery problems.

When provided with – in their view insufficient – means, the interventionists did not use them efficiently. They stuck to similar activities of providing support for income-source diversification to a limited amount of fishing people and supporting reforestation at a few river banks, and not undertaking any initiative to monitor fishing practices or sanction rules' offenders. As a result, very few fishermen benefited from the programmes. For instance, out of more than 10,000 fishery dependants, just about 400 people received credit for alternative income from two large projects (Interviews with CeCPA¹ & others, 2007–2011).

The interventionists hardly consulted the fishing people about possible solutions and their role therein, or on the intervention results and the reasons for the limited success. If they did, fishing people who were close to the interventionists in terms of relationship or geographically, were contacted. Those 'representatives' were expected to inform their peers, which was seldom the case according to the fishing people.

¹ Centre communal pour la promotion agricole, i.e. communal centre for agriculture promotion.

The interventionists seldom checked whether the other people were indeed informed. In conclusion, interventions consisted in practice of doing what interventionists perceived possible according to the limited means available, and of satisfying the demands of very few people.

5.6. Mismatches of interventionists

We inferred two main mismatches in the action theories of the interventionists: (1) ignoring self-diagnosed causes and (2) tolerating resources known to be insufficient.

The first mismatch relates to the fact that although interventionists were aware of the natural causes of the fishery problems, they tackled only a small part of these natural problems. Thus, the problems of siltation, floods, and obstruction of the distribution of fishery-related resources (foods and species) along the river – lagoon – sea system at the delta level remained very partially tackled. The diagnosed anthropogenic causes of the fishery problems such as the effects of the dam, overfishing practices, banks and mangroves degradations, partial involvement of fishing people in intervention processes, were also only partially addressed. Interventionists justified this mismatch by stating that they had no means to work on these issues for which they held the government, politicians, and powerful community members responsible.

The second mismatch is that they kept on using the limited means with which they could reach only a few fishing people knowing that it would be ineffective because of that.

6. Changes in stakeholders' action theories

As explained above, to assess whether learning took place during the RE process, we looked at changes in the stakeholders' action theories or more specifically whether the mismatches diminished or persisted. These changes were expected to be stimulated and become apparent during the homogeneous and heterogeneous group discussions.

6.1. From reliance on interventionists to trust in their own capacities

The first reactions of the fishing people to the feedback of the evaluator in the homogeneous group discussion consisted of confirming the evaluator's interpretations of their own action theories by referring to the same stories. About the action theories of interventionists, the fishing people showed to be aware of some aspects, like selective promotion of income generating activities, but unaware of other aspects of the interventionists' action theories like the preference of manual dredging over mechanical, and limitations of intervention resources. To recall, manual dredging by fishing people themselves was a major solution proposed by interventionists, while dredging with dredge machines operated by contract workers and financed by intervention programmes was proposed by the fishing people. With this example the evaluator addressed the first mismatch in fishing people's action theories; that is the unrealistic high expectations of interventionists' means and capacities to solve the fishery problems. A fisherman from Avlo-Houta village stated:

It seems that we are not learning from the fact that our solutions demand strategies have been failing for a long time.

The fishing people suggested that they could create village-level platforms in order to lobby for effective interventions to occur. To this end, some fishing people suggested documenting their problems and solution proposals, and diffusing this information via the internet (framed as “*ègbèmin noukpin*”, i.e. *literally “the world's mirror”* or “nowadays' mirror to communicate with the

world”), and radio and television. Others proposed having at least a five-minute radio programme per week or month about their problems and suggested solutions in order to be better heard by the powerful interventionists. Such new ideas emerging during the heterogeneous discussion show the RE process had generated confidence among the fishing people in their own capacities.

6.2. From passive towards active responses to perceived indifference of interventionists

As can be inferred from the analysis above, the solutions that the fishing people proposed are actions to be taken by themselves, ranging from platform creation to documentation of problems and solutions and lobbying. One can therefore deduce that the fishing people started regarding their own passivity as an important cause of the persistence of the problems. The following quote from a fisherman from Avlo-Houta Village during a homogeneous group meeting illustrates well this understanding in the fishing people:

Even when you send your own child somewhere and s/he does not come back on time, at least you manage to track his/her itinerary and to check why s/he is not coming back soon. We [fishing community], in the case of projects, after expressing our needs to interventionists, we just keep on expecting them to come back to solve the problems without trying to monitor and check what has been happening to them... Somewhere it's also our fault if we are not getting solutions to our problems... Therefore, I think that we should start monitoring the processing of our needs by interventionists.

The fishing people thus expressed that they wanted to play a more active role. To this end, the interventionists and the evaluators provided them and the interventionists with more supportive knowledge during the heterogeneous group discussion. The first knowledge shared with them related to the limitations and hence selectivity of the intervention resources. The second related to the important role of politicians and financial partners in determining intervention choices and allocating resources. These views of interventionists supported the fishing people's desire for platform creation and for the diversification of the potential intervention partners through diffusion of the problems and quests for solutions via the internet, radio, and TV, as expressed above (see Section 5.1).

Fishing community participants took advantage of the heterogeneous group discussion to express to some extent their concern to the interventionists. They were also informed by the interventionists about their entitlement and roles in the interventions of NGOs and projects. The fishing people's new roles included making sure that (potential) interventionists are informed about their problems and discussing collaborative solutions with them.

6.3. Continuance of unsustainable practices although priorities redefined

After the heterogeneous group discussion, the fishing people favoured dredging the rivers and the lagoons and retvetting the delta to preserve and regenerate resources, and to improve fishing people's livelihoods. They presented the view that the dredging should be done first in order to re-establish the habitat for the reproduction of fishery resources and for the transportation of stones for the revetment of the delta. If the dredging was going to take time, they suggested the construction of the *Gbèkon-Avlo-Houta* road for the revetment of the Grand-Popo Delta. The fishing people saw these two interventions as entry points for solving remaining problems such as lack of alternative income generation, flood, sweetening of the lagoon's brackish water, transport over the water and the proliferation of hippopotamuses. They also expected

these two solutions to stimulate them to respect rules more and adopt sustainable management practices because their overfishing practices originated mainly from fish scarcity and the absence of alternative income sources. As one participant (from *Avlo-Village*) in the heterogeneous group discussion said:

If there are limitations in resources to solve the problems, then dredge the water and put stones in the delta for us. That's all. We don't want anything more. The remaining will come. Isn't it so my colleagues?

This conclusion was supported by fishing community members during the heterogeneous meeting. When the fishing community participants heard about the limited resources available for the interventions, they started discussing less and less costly alternatives to all the solutions that they initially requested. However, the interventionists did not respond explicitly about how they could satisfy the requests of the fishing people that had become more restricted.

6.4. Sticking to ignoring diagnosed problems

In the homogeneous and heterogeneous group discussions the interventionists were asked to respond to questions of the evaluator about why they were not protecting the banks, working to reduce negative effects of the dam, providing income alternatives for fishing people, making fishing rules respected, dredging manually and selectively, and stabilizing the delta as they acknowledged them to be relevant solutions to the problems of the fishing people. Despite the reflection, the interventionists did not mention any possibility by which they themselves could bring the politicians and the financial partners to provide them with the resources necessary to deal with the natural and anthropogenic causes of the fishery problems. The interventionists continued to present themselves as dependent on the politicians who appoint them to execute their policy. This quote of an actor from the fishery directorate is illustrative of the experienced dependency:

"We know that the means available may not suffice to intervene effectively. However, we cannot be inactive. We should justify our existence/job."

Questions from the evaluator about planning competence and roles, designed to trigger interventionists to detect mismatches, led most of them to suggest solutions to which they themselves could contribute, like providing people and politicians with suggestions to improve fishery management.

Thus, all kinds of diagnosed problems, such as destruction of the banks and the negative effects of the *Nangbéto* dam, remained unaddressed by the interventionists.

6.5. From tolerating insufficient means to seeking collaboration to persuade the politicians

After being exposed to critical reflection questions in the homogeneous and heterogeneous meetings about how to sincerely improve in effectiveness of interventions, some of the interventionists – backed later by all interventionists – suggested that there was a need for mutual "engagement" or "commitment". The interventionists mentioned that politicians should also prioritize relevant problems to solve and provide sufficient resources to interventionists; interventionists should deploy strategies towards effective problem solving; and fishing people should engage more effectively in intervention processes. To confirm this necessity for mutual commitment, all participants in the heterogeneous group discussion stated that they believed in the resolution of the problems mainly under this condition of mutual commitment.

To acquire the relevant means, the interventionists mentioned the fishing people as the ones who could put pressure on the politicians if they were empowered by interventionists and well informed about intervention processes and the roles they could play. In a similar way, the financial partners could be addressed. Most interventionists suggested organizing or helping the fishing people to organize themselves for the sake of lobbying for more resources. Two of the interventionists suggested that the financial partners should intervene directly at fishing community level without the intermediation of the politicians, who were perceived as a major cause of the failure of interventions because of their administrative delays and the misappropriation of funds for political reasons, like vote catching.

The interventionists also suggested training for themselves to increase their competences in planning and management. This suggestion came mainly from the municipality staff.

In all, during the heterogeneous group discussion, the interventionists involved in the RE process showed concern about exchanging knowledge and ideas with the fishing people and the local politicians about intervention processes in NGOs and projects and the roles the fishing people should play.

7. Analyses of learning

In this section, we discuss the changes in action theories that occurred during the RE process in terms of learning. From the analysis of the findings, one can deduce three types of learning: single-loop, double-loop, and social learning. In addition, we discuss how the RE approach contributed to the learning that occurred, and what challenges it faced.

The participating fishing people reduced the number of their priorities, which would cost less. This seems to be a strategy to get faster solutions to their problems. We qualify this learning as single-loop level because it does not involve a change of values underlying the fishing practices. The fishing people continued to violate the fishing and sustainable management rules, although they themselves regarded these unsustainable practices as one of the main reasons for the fishery problems.

Single-loop learning among the interventionists concerned the new idea to stimulate people to lobby the politicians and financing actors for more resources. This learning also does not involve the fundamental reasons for the actions of the interventionists themselves, because they do not address how they themselves could stimulate the politicians and financial partners to provide them with the necessary means to solve the problems.

In addition, we saw some *double-loop learning*. Before the group discussions, the fishing people regarded themselves as ignorant and less powerful and capable to deal with fishery problems than the interventionists and politicians. They learned that their trust in the capacities of interventionists was ill-founded, and that their passivity contrasted with their real concern to achieve effective solutions. These new insights have brought the fishing people to redefine the interventionists' capacities as limited and conditioned by available resources and lobbying. Subsequently, they gained trust in their own capacities and redefined their own roles as more active to show concern for solving their problems, to diversify their intervention partners, and to lobby for solutions.

The suggestion of empowering the fishing people to lobby with politicians and financial partners in collaboration with interventionists about their problems may also be seen as double-loop learning by the interventionists. Such collaboration would mean that they would have to change their intervention practices fundamentally.

In addition, we noticed an emergent congruence in the action theories of the two stakeholder categories with regard to the need for mutual commitment to the effective solving of the fishery

problems. The fishing people developed the idea to create local platforms to participate actively in intervention processes and make interventionists and politicians realize the urgency of their needs. The interventionists learned that they could contribute to the empowerment of the fishing people by sharing knowledge about entitlement and intervention processes, and by facilitating the creation of platforms to commit politicians and subsequently interventionists and financial partners to problem solving. We refer to this match in the views of the participants as *social learning*, because it resulted from the interaction among the fishery stakeholders (Blackmore, 2010; Jiggins, Röling, & Van Slobbe, 2007; Maarleveld & Dangbégnon, 2002). So, in addition to single-loop and double-loop learning in the RE approach, social learning among interventionists and fishing people occurred.

Notwithstanding the learning that took place, not all mismatches were reduced or altered. The persisting mismatches were the neglect of some natural and anthropogenic causes of diagnosed fishery problems and the continuance of fishing practices that are known to be unsustainable. To tackle these causes of the fishery problems, the interventionists continued to regard themselves as dependent on the will of the politicians and the financial partners for the necessary resources. They testified that they could not challenge directly the politicians who appointed them, because of their need to preserve their job and salary. They suggested to take action indirectly by sharing information with the fishing people, whom they expected to be better able to influence the politicians' decisions. The fishing people did not change their fishing practices, although they seemed aware of the threat that these practices represent for their livelihood.

In all, we can conclude that the contextualized RE contributed to stimulate single loop, double loop, and social learning among the fishing people and interventionists, but also has limitations with regard to stimulating learning.

8. Discussion

The RE approach did contribute to some relevant changes in the action theories of the stakeholders. This illustrates that RE may be a relevant approach to stimulate interaction and learning among stakeholders. However, the changes were related to espoused theories mainly. While this partly can be attributed to the moment of evaluation which was right after the RE process when changes in practices could not be expected yet, the limitations seem more fundamental because they hardly involved double-loop learning. The limitations in the learning suggest that RE in the context of NRM needs further improvement.

Several factors may explain these limitations. Among others, one can mention the scale of the problems compared to the available intervention capacity and means; the total despair among fishing people and loss of confidence that the problems could ever be solved. Uncertainty and absence of trust are all well known to hinder learning (Leeuwis, 2004; Pratt et al., 2009; Williams & Imam, 2006). The more complex and uncertain a situation appears for people, the less they are motivated to deploy the necessary effort to learn about it. This could have been the situation in the context of Grand-Popo. The lack of learning about how to convert to more sustainable fishing practices, may well relate to the threats anticipated by the fishing people. Sustainable fishing practices would involve the reduction of fishing frequencies, fishing areas, fish quantity captured per unit of time via quota, and finally income, at least in the short term and for the powerful and more active fishermen. Aversion to such sacrifices seems to have hindered learning by these fishermen. The RE approach may have led to better learning if more concrete alternative solutions would have been proposed and discussed. The evaluator could have provided alternatives with examples of how other

interventionists overcome the limitations of means elsewhere. However, we cannot assume that the discussion of such alternatives leads to changes in short term, because of the systemic characteristic of the problems and the many other interdependent constraints for fishery management. Hence, it seems that much more time needs to be devoted to exploring, designing and developing solutions that are feasible as well as desirable for the fishing people.

Secondly, the expectations of both stakeholder categories about the goals and results of the RE interventions may have influenced the reflections and learning. Indeed, both the interventionists and fishing people seem to have engaged in the RE process with the expectation that it would lead to concrete solutions or to the design of a new project from which they could take advantage. The interventionists perceived their own influence and intervention means to be limited and hence expected the problems to be solved in the RE process, rather than to have to reflect on ambiguity and mismatches among their action theories. The same accounts for the fishing people who expected to get more help from the interventionists and other powerful local people while the evaluator tried to stimulate the fishing people to become more active. Even though the evaluator told them about the actual goals of exchange and learning, they could have regarded this as a researcher hiding the true cause. The fishing people may have been hesitant to mention ideas because of fear that the interventionists would misuse these ideas. The attribution of the limited effectiveness of interventions to shortage of financial means can be considered as an illustration of this concern. Also, the complaints of the fishing people about the unfulfilment of their expectations with regard to the interventions could be a strategy to trigger the benevolence of the evaluator and other people with access to the report of the researcher. Further RE interventions may take into account such strategic behaviours.

Finally, during the final interaction in the heterogeneous meeting there seems to have been a lack of willingness to open up to one another, which is essential for learning among different kinds of actors. This shows in the fact that both stakeholder categories brought up some issues during the interviews and in the homogeneous group meetings that they no longer addressed in the heterogeneous meeting, such as corruption and the prevalence of material interests of stakeholders over those of effective interventions. Thus, they may have been afraid that discussing these issues openly would lead to severe sanctions (Aarts, van Lieshout, & van Woerkum, 2011; Potter, 1996). Hence, RE evaluators need to be aware that a heterogeneous dialogue should not be planned too early and that more than one heterogeneous group meeting may be necessary to stimulate open feedback exchange among stakeholders.

9. Conclusion

For a long time, fishing people in Grand-Popo have been facing fishery resource scarcity and livelihood impairment. Generations of interventions remained ineffective although the interventionists articulated a willingness to solve these problems. After unravelling the ambiguity between, and mismatches in, the action theories of the fishing people and the interventionists, we designed and conducted a responsive evaluation (RE) approach to stimulate double-loop learning among the stakeholders (Kouévi et al., 2013). This article discusses the contribution of this action research approach to learning by the stakeholders.

We showed that the contextualized RE approach contributed to stimulate single loop, double loop and social learning among interventionists and fishing people of Grand-Popo. Thus, the RE process helped to empower the fishing people and diminished the ambiguity and mismatches among action theories to some extent.

However, we also discovered limitations in the learning, and concluded that it is hard to stimulate learning in NRM with RE. Hence, we provided suggestions to enhance RE in the context of NRM.

The main contribution of this work for the fields of NRM and evaluation is the operationalization of the concept of learning in terms of changes in espoused action theories and theories in use. We put emphasis on the reasons and strategies underlying NRM actions. The field of NRM usually emphasizes social learning, which is globally considered as learning resulting from social interactions among people (Muro & Jeffrey, 2008). In contrast, our operationalization of learning allows a systematic analysis and comparison before and after an intervention, by studying changes in action theories. In this way, we were able to draw on empirical evidence to show how and to what extent the contextualized RE did contribute to learning among NRM stakeholders.

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