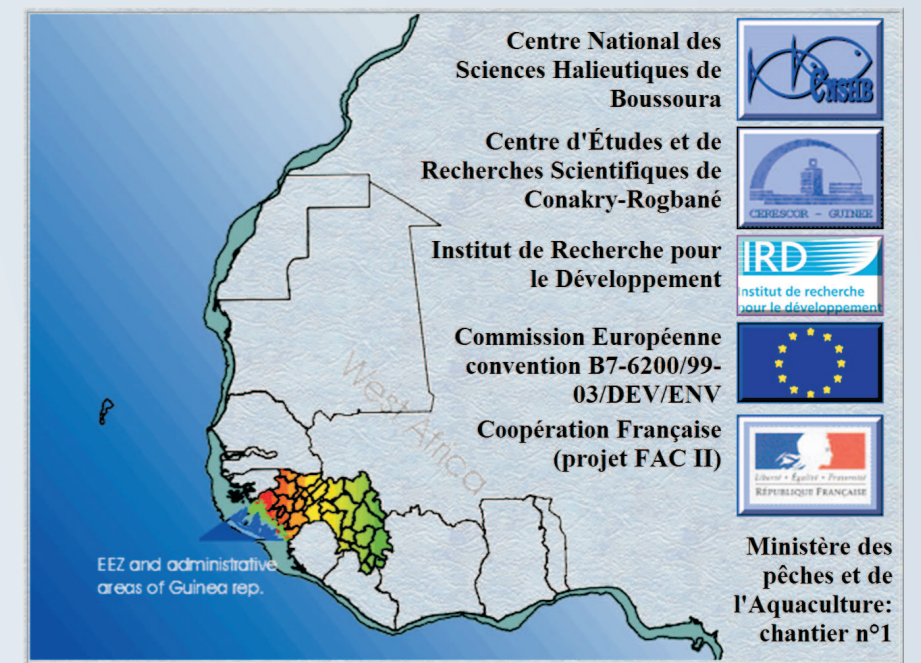


# Contribution of complex systems approaches to the development of a research capacity for the fishery sector in Guinea (West Africa)

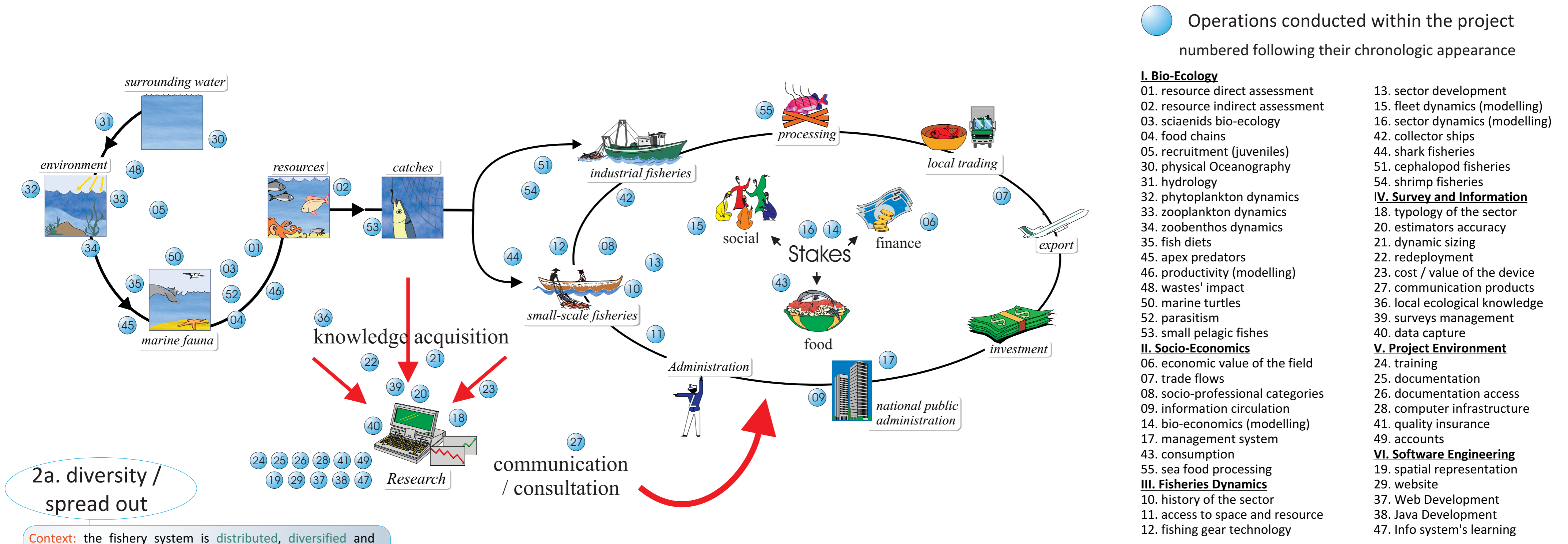
Keywords: Complex systems approaches / Fishery sector / Guinea (West Africa) / development project / research capacity /



## 1. Context and goal :

The Guinean fishery sector is a diversified and distributed system ranging from plankton in the sea to the plate of foreign consumers (figure below). We present here a project for the building of a research and information capacity for the fishery sector in Guinea (West Africa) designed according to principles inspired from the complex systems approaches (inserts 2a-2e and tems in green).

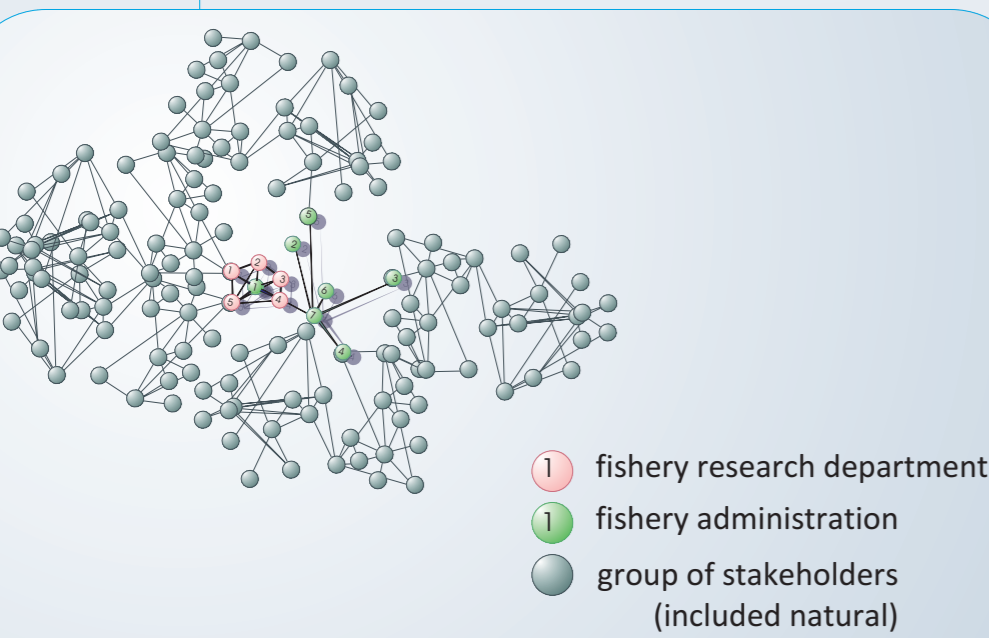
Integrated diagram (model) of the fishery sector. The main dimensions are figured; operations of the project (circles) are located according to their theme(s). Operations' legend on the right.



### 2a. diversity / spread out

**Context:** the fishery system is distributed, diversified and evolving.  
**System design:** distributed set of semi-autonomous research operations, each considered as shedding light on a given aspect of the fishery sector (figure above)  
**Expected outcome:** adaptive, reactive and versatile research system: able to catch and proceed any of the diversity of events occurring in the system.

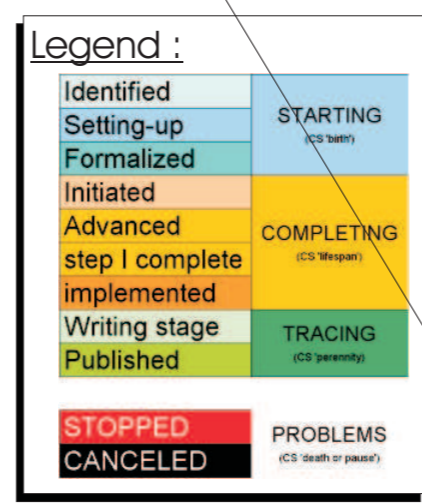
### 2b. Hierarchy & embeddedness



#### A distributed view of the fishery sector

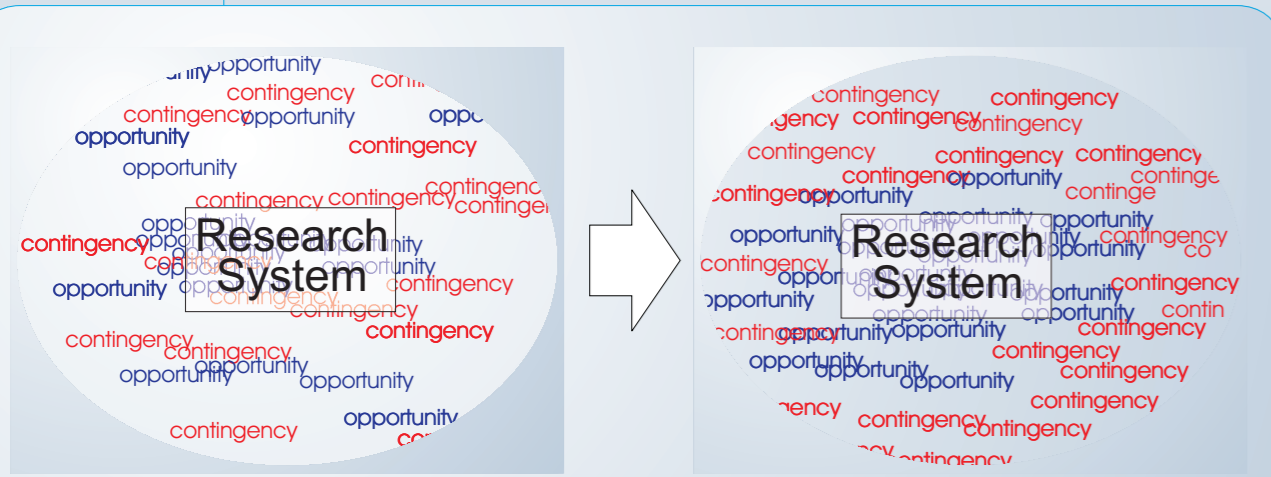
**Context:** the fishery system is considered as a complex network. An operational research would benefit from being included within the system.  
**System design:** The project was considered as embedded within the fishery system, within the institutional system. Up to the single operation, all scales were considered accordingly.  
**Expected outcome:** fitness, viability of the research system.

**Chronogram of each operation status within the project.** Operations are semi-autonomous. They are formatted equally to better share and interact. Their specific evolution is not monotonous. Given the number and compactness of operations, one operation can stop without questioning the global project. The number of operation changes.



Head of the operation	01/00	02/00	03/00	04/00	05/00	06/00	07/00	08/00	09/00	10/00	11/00	12/00	13/00	14/00	15/00	16/00	17/00	18/00	19/00	20/00	21/00	22/00	23/00	24/00	25/00	26/00	27/00	28/00	29/00	30/00	31/00	32/00	33/00	34/00	35/00	36/00	37/00	38/00	39/00	40/00	41/00	42/00	43/00	44/00	45/00	46/00	47/00	48/00	49/00	50/00	51/00	52/00	53/00	54/00	55/00
<b>I. Bio-Ecology</b>																																																							
Diallo Braxima	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55
<b>II. Socio-economics</b>																																																							
Diallo Mamadou Oury	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55					
<b>III. Fisheries Dynamics</b>																																																							
Camara Youssouf Hava	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55									
<b>IV. Survey &amp; Information</b>																																																							
Le Fur Jean	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55															
<b>V. Project Environment</b>																																																							
Dominic François	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55																							
<b>VI. Software Engineering</b>																																																							
Guilvogue Albanese	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55																		

### 2c. 'contextuality'



**Context:** promoting diversity of operations reduces control on each specific action. Contingencies grow accordingly to the number of operations.  
**System design:** Emphasis was placed on improving the global environment of the research system jointly to the autonomy of operations leaders  
**Expected outcome:** Global enhancement of the system with synergies due to scale effect (better communication).

**3. Global result: reactive and adaptive set of interacting operations:** a research system embedded in the fishery system and able to connect to new events or focus themes.

### 2d. reactiveness

**Context:** future key questions and key components involved (e.g., trade, fleets, social, target species, ...) in the development of the fishery sector cannot be foreseen.  
**System design:** focus on the versatility and flexibility of operations (see table above right)  
**Expected outcome:** Enhanced timeliness of the research system which can quickly switch to tackle new questions

### 2e. historical contexts

**Context:** sustainable development projects follow one another; they should be part of a global development process.  
**System design:** The project was considered as a construction enclosed in its own history (ontology): within the research system, effort was made to build on what was realized before (previous projects) and work on various future long terms scales (training)  
**Expected outcome:** sustainability of the whole research system



**4. Unexpected short-term outcome:** the project organized a closing conference for restitution of this work. Almost all stakeholders attended : after three days of exchange upon the operation results, conference participants jointly established a common and mutual formal recommendations list to the attention of stakeholder institutions in the Guinean fisheries sector: supervisory authority, fishery administration, development partners in the sector, fisheries research and profession.

