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GROUP FARMING AND COLLECTIVE ACTION Does the French model hold lessons for Indian and French farming futures? FINAL REPORT Project No. 4001-GF

Bina Agarwal, Birgit Müller, Bruno Dorin

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GROUP FARMING AND COLLECTIVE ACTION

Does the French model hold lessons for Indian and French farming futures?

FINAL REPORT
Project No. 4001-GF
September 2019

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BINA AGARWAL
(Indian PI for primary survey and macro-level secondary data analysis)

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PREFACE

This Report covers both macro-analysis of French group farming systems based on France’s Agricultural Census Data, and detailed case-study analysis based on data obtained through a primary survey conducted in Eastern Central France (during October 2015–November 17).

We are most grateful to IFCAR/CEFIPRA for funding the primary survey in France, and to the Service of Science and Technology (SST), French Embassy, Delhi, for supplementary financial support. We are also grateful to officials in the Ministry of Agriculture, Agri-food and Forests, Paris, for helping us with sample selection using the Agricultural Census data, and to several other institutions for logistical support: The Institute of Economic Growth, Delhi; the EHESS, Paris; and the CSH, Delhi. We owe special thanks to many people for their valuable inputs and insights during the survey: Eric Mastorchio (GAEC and Sociétés, Paris), Frédéric Courleux and Alexis Grandjean (then at the Ministry of Agriculture, Agri-food and Forests), Jean-Claude Teurlay and Jérôme Lerbourg (Ministry of Agriculture, Paris), and Bruno Dorin (CSH, Delhi, and CIRAD, Montpellier) for his inputs in the survey sample design. We are also grateful to our Research Assistants in France—Daniella Blake, Gaëlle Bossuette, Soazic Dhorne, Leo Florent, Jules Hermelin and Mathilde Montzieux—who conducted the field survey, and to the Research Assistants in Delhi who helped with the analysis at different points in time: in particular Ram Ashish Yadav, Pervesh Anthwal, Swati Singh, Gayatri Yadav, S. Sridharan and Sanjiv Pasricha.

Signed

Bina Agarwal

Birgit Müller

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INTRODUCTION

Bina Agarwal

Agricultural productivity and ecosystems conservation depend not only on the technical aspects of science and innovation, but also critically on the institutional structure of production. India (like much of the developing world) is characterized by millions of small family farms facing severe constraints in access to land, water, other inputs, credit, information and markets. It is notable that globally, 84% of farms across 111 countries cultivate under 2 hectares. To revitalise agriculture and promote sustainable livelihoods and food security, we thus need institutional innovation—one that will help small farmers overcome production constraints, adopt new technologies, tap market opportunities and tackle climate change. Can group farming, with resource pooling and cooperation among farmers provide an answer?

This unique project uses a cross-learning approach to study the potential of group farming which has taken different forms in France and India. In particular, it seeks to research the long-standing (but little studied) French model of GAECs (*Groupement Agricoles d'Exploitation en Commun*)—through a primary survey as well as secondary data analysis, to identify the factors underlying the success and sustainability of GAECs, and to evaluate what features could be adapted in India to strengthen and expand existing initiatives here. In addition, the study seeks to identify features of GAECs which could be modified for enhancing their reach within French agriculture. In this way the project is aimed at providing insights for both French and Indian farming futures. It will also be of interest for on-going debates about the future of agricultural cooperatives in other parts of the world.

The empirical analysis is based on two types of data:

- (a) Macro-data for the whole of France: these data have been statistically analysed by Bina Agarwal and Bruno Dorin to explain the uneven geographic spread of GAECs across France, and differences between GAECs and other farms in their institutional and economic trajectories.
- (b) An interdisciplinary primary survey of a sample of 60 GAECs and a control sample of an equivalent number of individual farms principally from two departments of France — Ain and Saône-et-Loire, with a few cases taken from bordering districts to complete the purposive sample with the planned features. The survey used focus group discussions as well as individual interviews with farmers to obtain a range of historical, demographic, production-related, ecological and institutional information, which is both qualitative and quantitative in scope.

The primary survey was undertaken by Bina Agarwal and Birgit Müller and was analysed by them separately from two disciplinary perspectives – the former from an institutional and economic perspective and the latter from an anthropological perspective.

Objectives

Three main objectives of this research were as below:

1. To examine and explain regional variations in the concentration of GAECs and the type of farm activity they focus on—intensive livestock vs. mixed crop production. This can also throw light on whether certain contexts are more conducive to cooperation and group farming than others.
2. To study GAECs in depth through a sample survey—their histories, functioning, design principles, and production systems; the challenges they face; their broad economic outcomes; and the farmers' perceptions of the benefits and downsides of being in a GAEC. In addition, we sought to compare GAECs with individual farms.

This would also help draw lessons for Indian agriculture where rather different models of group farming have been promoted, such as in Andhra Pradesh and Kerala in India, which the Indian Principal Investigator (PI) researched independently of this project, during 2012-14, and was not funded by IFCAR/CEFIPRA.

3. To use an understanding of GAECs for the benefit of French agriculture itself, by identifying which features of the model work well and which may need modification with changing social, demographic and economic conditions in the country.

This Report is in four parts. Part I below gives an overview of group farming in France and its geographic variations, based on macro-data analysis of a published paper by Bina Agarwal and Bruno Dorin (French co-PI). Intellectually, this is part of the IFCAR/CEFIPRA project, but for which no funding was provided by IFCAR/CEFIPRA. Parts II and III are based on the survey undertaken in France with IFCAR/CEFIPRA funding. Part II, written by the Indian PI, Bina Agarwal, presents the survey sample details and results as viewed from an institutional and economic perspective. Part III written by French co-PI, Birgit Muller, analyses the survey results from an anthropological perspective. In Part IV, Agarwal provides a short comparison of French and Indian group farming to draw some lessons for both countries. It also presents concluding reflections.

PART I

MACRO-VIEW OF GROUP FARMING IN FRANCE: Explaining Regional variations

Bina Agarwal and Bruno Dorin¹

1. Background

France has perhaps the world's oldest and numerically the most important example of voluntarily-constituted and legally-enabled group farms, as embodied in GAECs since the 1960s, and, to some extent, in EARLs (*Exploitations Agricoles à Responsabilité Limitée*)—another type of group farm introduced in 1985. Based on farmers pooling land, labour and capital, this model is of considerable contemporary interest for both France and other countries. Catalysed by a 1962 law, GAECs accounted for 7.6 per cent of farms and 15 per cent of agricultural adult work units in 2010.

Given their long existence and numerical strength, a study of group farms in France can thus provide particular insights on the characteristic features of these farming models and the contexts in which they emerge. Moreover, the regional clustering of GAECs in north-western and central-eastern France (see Figures 1 and 2) begs the question: Do regions with more GAECs have features especially conducive to cooperation, such as the local economy, ecology, demography, culture, or a mix of these and other factors? An analysis of these factors is of interest both in itself and to help us understand which underlying factors are more conducive to the formation of group farms. This understanding could also provide lessons for the potential adaptability of such models beyond France.

Using data from the French agricultural census and other sources, Bina Agarwal and Bruno Dorin sought to identify the factors—economic, ecological, social and demographic—underlying this regionally uneven development of GAECs and comparatively of EARLs. Our paper examines both types of farms but in this Report we focus especially on our results for GAECs.

The questions we pose have been little researched, especially the factors underlying the regional clustering of group farms. Our research thus breaks fresh ground. It also helps to throw light on an under-researched and internationally inadequately recognised model of group farming.

2. Legal and conceptual issues

Legally, GAECs were catalysed in France by a law passed in 1962, which became fully effective in 1965.²³ The law specified a legal minimum of two partners/associates and a maximum of ten, with the requirement that all partners work full time on the farm.

¹ This section of the Report provides a summary of the main findings of Bina Agarwal and Bruno Dorin's macro-analysis, published in Bina Agarwal and Bruno Dorin (2018). 'Group farming in France: Why do some regions have more cooperative ventures than others?' *Environment and Planning A: Economy and Space*, 2018. <http://dx.doi.org/10.1177/0308518X18802311>

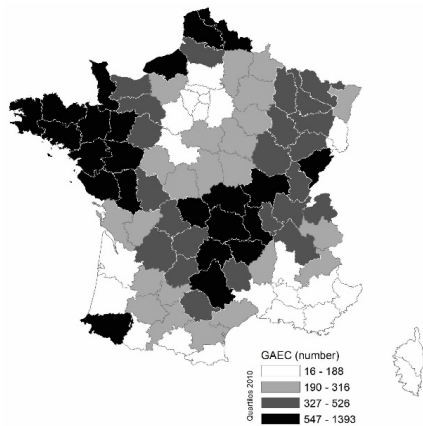


Figure I.1. GAECs number in 2010. Source: Agarwal and Dorin (2018)

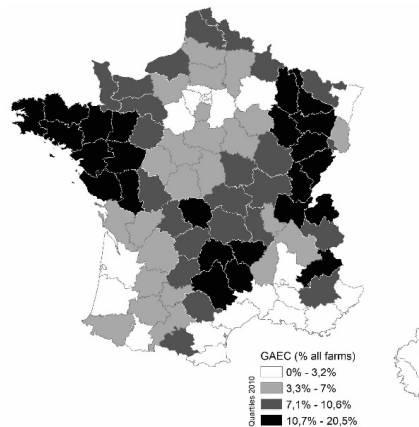


Figure I.2. GAECs as a percentage of all farms in 2010. Source: Agarwal and Dorin (2018)

Socially, however, GAECs were propelled especially by the Young Catholic Farmer's Movement, supported by some intellectuals and high level civil servants who were seeking to modernise family-based agriculture. The GAEC was seen as an institutional innovation close in structure to a family farm, in contrast to a corporate farm dependent largely on hired employees.

² Raup PM (1975) 'French Experience with Group Farming: The GAEC'. Staff Paper P 75-22. St Paul, MN: Institute of Agriculture, University of Minnesota.

Forming a GAEC was expected to help individual family farms improve their managerial efficiency, productivity, and work conditions (GAEC & Sociétés, 2010a).⁴ For instance, by pooling their resources even farmers with limited means could potentially modernise their farming techniques and farm organisation; experiment with new technologies which needed too much capital for an individual farmer; take advantage of scale economies; and free children and spouses from agricultural work to seek higher education or non-farm jobs.

Additional advantages could include the ability of group farms to provide viable livelihoods to those (especially the young) who lack adequate land or capital to farm alone, or who liked rural living and are open to cooperating to establish a less strenuous work situation offered in a GAEC relative to individual farms. GAECs, for example, allow substitution between associates for monotonous labour-intensive work and for family holidays, access to capital intensive machinery via resource pooling, expansion of farm size, diversification of activities or specialisation in labour-intensive work such as animal breeding, and so on. In a close working relationship between associates, informal work monitoring is possible to overcome tendencies to free ride through peer-vigilance, and so on.

Moreover, in recognising sons and fathers as equal partners, GAECs enhanced the status of sons within the family, and thus their incentive to work harder and increase productivity. Farmers' wives, however, remained unequal, both economically and socially. Under the law, married couples could not become associates without the presence of a third associate, until a change in law in 2010 allowed spouses to constitute couple GAECs. Today many GAECs have sustained for long years (one GAEC, Copex, is over 50 years old), and have moved to another generation of associates.

3. GAEC Characteristics and changes over time

We use department-wise data from the French Agricultural Censuses of 2010, 2000 and 1988 (Ministry of Agriculture, 2014)⁵ to map French farming enterprises over time. We exclude 4 of the 96 departments of metropolitan France which are highly urbanised and have few farms.

3.1 Farm types and shifts over time

From Table 1 we note that in 2010, individual farms, GAECs, and EARLs respectively constituted 69.4 per cent, 7.6 per cent and 16.0 per cent of all farms (Table I.1). Almost half the EARLs had only one associate, making them effectively similar to individual farms, except for their legal status.

Between 1988 and 2010 (a period of 22 years), individual farms declined sharply while between 1988 and 2000, GAECs and EARLs increased notably in both numbers and proportions, after which GAECs showed a slight decline. After 2010, however, even GAEC numbers have been rising. According to *GAEC & Sociétés*, 2,296 new GAECs were

⁴ *GAEC & Sociétés* is the national association of GAECs founded by several organizations, including FNSEA, the main farmer's union in France. It publishes the journal *Agriculture de Groupe*.

⁵ Some details (e.g. on the social composition of GAECs) are not available in censuses prior to 1988.

registered in 2014 alone, many of them being couple GAECs which were by then legally permitted.⁶

In proportional terms, GAECs doubled between 1988 and 2010 from 3.7 to 7.6 as a percentage of all farm enterprises.

Table I.1 Farms by legal status in 1988, 2000, 2010

Type of Farm	1988		2000		2010	
	No.	%	No.	%	No.	%
Individual	945,801	93.0	537,444	81.0	339,836	69.4
GAEC	37,708	3.7	41,474	6.3	37,204	7.6
EARL	1,523	0.2	55,913	8.4	78,594	16.0
Other	31,384	3.1	28,785	4.3	34,252	7.0
All farms	1,016,425	100.00	663,616	100.00	489,886	100.00

Source: Agarwal and Dorin (2018). Figures calculated from the 1988, 2000 and 2010 agricultural censuses (Ministry of Agriculture, 2014)

Note: In this and subsequent tables, all farms (small as well as professional) are included.

3.2 Social composition of group farms

The majority of GAECs are constituted only of family members (84 per cent in 2010). This continues over time, but proportionally family GAECs have been declining and non-family or mixed GAECs have been increasing (Table I.2). Among family GAECs, those made up by father and son fell from 59 to 28 per cent between 1988 and 2010, while same-generation GAECs—typically of brothers or cousins—doubled. This suggests that GAECs are moving towards equality among associates (since father-son GAECs contain an implicit social hierarchy, notwithstanding their equal legal status as associates).

Table I.2. GAEC and EARL by social composition in 1988, 2000, 2010

Type of GAEC and EARL	1988		2000		2010	
	No.	%	No.	%	No.	%
GAEC						
1. GAEC mixed	460	1.3	1,596	4.1	2,654	7.4
2. GAEC Non-Family	1,152	3.3	2,655	6.9	3,100	8.7
3. GAEC Family	32,891	95.3	34,489	89.0	29,951	83.9
- GAEC Father & Son	(19,283)	(58.6)	(11,286)	(32.7)	(8,285)	(27.7)
- GAEC same generation	(7,598)	(23.1)	(15,368)	(44.6)	(14,799)	(49.4)
- GAEC several generations	(5,965)	(18.1)	(7,602)	(22.0)	(6,434)	(21.5)
- GAEC couple ^a	(45)	(0.1)	(233)	(0.7)	(433)	(1.4)
All GAEC with information ^b	34,503	100.0	38,740	100.0	35,705	100.0

Source: Agarwal and Dorin (2018). Figures calculated from the 1988, 2000 and 2010 agricultural censuses (Ministry of Agriculture, 2014)

Notes: ^a Couple GAECs were not legally permitted till 2010. These numbers could thus reflect either misreporting or farms in transition which earlier had >2 associates.

^b Excludes cases with missing information on GAEC type

⁶ Personal communication, Eric Mastorchio, March 2016. In the absence of census data after 2010, these figures are strongly indicative.

GAECs are substantially larger in average area measured in terms of ‘*Surface Agricole Utile*’ (SAU) or utilised agricultural area,⁷ relative to other types of farms, and grew faster than them between 1988 and 2010.⁸ Notably too, multi-generational family GAECs and GAECs of both family and non-family associates tend to be the largest, going up to 180 ha on average. A larger number of associates allows the farms to diversify their activities and expand in area. Such expansion is also needed for them to earn an adequate income per associate from GAEC activity, since work outside the GAEC is not strictly allowed.

3.3 Activity specialisation

Most importantly, group and individual farms differ notably in terms of activity specialisation. In 2010, almost a quarter of all farms specialised in seasonal crops (mostly cereals and oilseeds), 42 per cent in animals, and 21 per cent in horticulture or gardens, plantations and vineyards, the rest doing mixed farming (Table I.4). However, these proportions varied significantly by farm type. Over 65 per cent of GAECs were into animal rearing (with 51 per cent breeding meat and/or milk cattle), and only 10 per cent were cultivating crops.

Table I.4: Product specialisation by farm type in 2010

Farm specialisation (OTEX)	All Farms		GAEC		EARL \geq 2 associates		Individual farms	
	No.	%	No.	%	No.	%	No.	%
Field crops	118,748	24.3	3,740	10.1	7,846	22.3	82,035	24.3
Cattle	120,526	24.7	18,791	51.0	11,113	31.6	77,806	23.0
- Meat	(59,519)	(49.4)	(4,150)	(22.1)	(2,374)	(21.4)	(48,404)	(62.2)
- Milk	(50,219)	(41.7)	(11,653)	(62.0)	(7,594)	(68.3)	(24,056)	(30.9)
- Mixed	(10,788)	(9.0)	(2,988)	(15.9)	(1,145)	(10.3)	(5,346)	(6.9)
Sheep &/or goats	56,216	11.5	2,549	6.9	1,699	4.8	47,974	14.2
Pigs, cattle (stall-fed) and/or chicken	29,881	6.1	2,721	7.4	3,723	10.6	15,931	4.7
Mixed farms	59,579	12.2	6,782	18.4	5,185	14.8	39,837	11.8
Horticulture or Plantation	32,865	6.7	862	2.3	1,432	4.1	23,934	7.1
Viticulture	69,872	14.3	1,424	3.9	4,122	11.7	50,347	14.9
All farms with OTEX information	487,687	100.0	36,869	100.0	35,120	100.0	337,864	100.0
Unlabelled farms	1,770	-	0	-	0	-	1,536	-
No information on OTEX	429	-	335	-	727	-	436	-
All farms	489,886		37,204		35,847		339,836	

Source: Agarwal and Dorin (2018), Figures calculated from the 2010 agricultural census (Ministry of Agriculture, 2014)

Note: Percentages exclude farms which were unlabelled or had missing information on specialisation. Figures in brackets are subcategories of cattle breeding.

There is clearly a link between GAECs and farm specialisation. Rearing animals tends to be much more labour intensive than crops, since animals need daily care. Moreover, this intensity continues throughout the year and, unlike crops, is not limited to seasonal peaks. Hence we would expect farmers who want to rear animals to veer towards group farming.

⁷ Excludes cases with missing information on associate numbers.

⁸ France distinguishes between ‘small’ farms and ‘professional’ farms (viz. ‘medium’ and ‘big’ farms), based on their annual Standard Gross Production or ‘SGP’. (www.insee.fr/en/metadonnees/definition/c1354). For international comparability, we used agricultural area rather than SGP to define farm size.

Ecologically too, regions which favour animal rearing are likely to have more GAECs, such as many mountainous or semi-mountainous areas (as, say, in parts of central-eastern France) where crop cultivation tends to be less profitable. Similarly, regions with more permanent pastures provide fertile ground for forming GAECs, although, technically, intensive livestock breeding is also possible through stall-feeding. Figure 3, which gives the regional spread of all farms specialising in animal breeding,⁹ reveals an interesting overlap between animal farming regions and the GAEC concentrations noted from Figures 1 and 2: both show concentrations in western and eastern France. In turn, we would expect animal breeding to be linked to permanent pastures. Figure 4 gives us permanent pasture land as a percentage of SAU. Here the overlap with GAEC incidence and animal farming is broadly consistent in eastern France but not in the west, where, as in Bretagne, which has limited pastures and hence the animals are largely stall-fed.

4. Explaining regional variations

We used regression analysis to identify the factors explaining regional variations in GAEC incidence. Some factors are economic, others ecological, social/cultural, or demographic. The analysis is based on 2010 data, unless another year is mentioned. All equations are adjusted for regional fixed effects based on the administrative classification of France into 13 regions in the early 2010s.

Table I.5 gives the results for GAECs. Of the two economic variables, the outcomes for farm size are particularly interesting. We find that the higher the proportion of 20-49 ha farms and the lower the proportion of ≥ 50 farms in 1970, the higher the share of GAECs to all farms in 2010. Hence, the regional incidence of GAECs in 2010 rises with an increase in the proportion of 20-49 farms, but falls with an increase in the proportion of ≥ 50 farms in 1970, while departments dominated by < 20 ha farms come in-between. In short, departments where most farms were neither too small nor too big in 1970 had the highest proportions of GAECs four decades later.

On our second economic variable, the Gini index of household taxable income, Departments with higher levels of income inequality have a significantly lower proportion of GAECs relative to all farms. Of the two ecological variables, however, only the pasture variable is significant: the higher the percentage of permanent pasture to total farm land in the department the greater the proportion of GAECs to other farms, while irrigable area is negative but insignificant.

⁹ Animal breeding includes farms breeding cattle for milk and/or meat (grazed or stall-fed), sheep, goats, pigs and poultry.

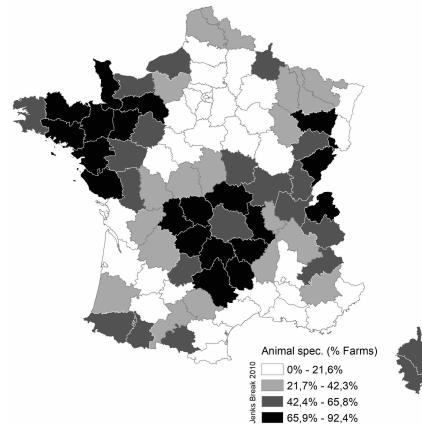


Figure I.3. Farms specialising in animal breeding as percentage of all farms in 2010
Source: Agarwal and Dorin (2018)

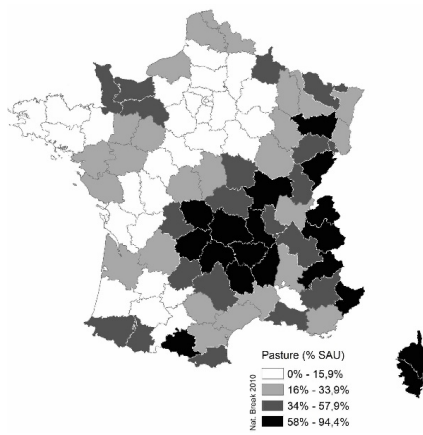


Figure I.4. Permanent pastures as a percentage of SAU land in 2010
Source: Agarwal and Dorin (2018)

Table I.5. Geographic variations in the incidence of GAECs:
Regression results

Explanatory variables	Dependent variables: % of total farms in 2010
% farms with SAU 20-49 ha, 1970	0.154*** (0.000)
% farms with SAU ≥50 ha, 1970	-0.106*** (0.001)
Income Gini index, 2010 (from 0 to 100)	-0.398*** (0.042)
% SAU under permanent pastures, 2010	0.077*** (0.000)
% SAU 2010 that was irrigable in 2007	-0.047 (0.119)
No. of active priests, circa 2010-2014	0.008* (0.055)
% students specialised in agriculture, 2010	0.346** (0.023)
% women among farm workers, 2010	-0.916*** (0.000)
Controlled for 13 regions	yes
Constant	43.747***
N	92
Adjusted R ²	0.82

Source: Agarwal and Dorin (2018).

Notes: All regression equations are with robust standard errors and adjusted for regional effects
Figures in parenthesis are *p* values. Significance: *** at 1% ** at 5%; * at 10%

The social variable is again significant. The greater the number of active priests in a department, the greater the percentage of GAECs to other farms, although the coefficient is small. The demographic variables have an important impact, however. Departments with a higher proportion of students specialising in agriculture have a significantly higher percentage of GAECs, and those with proportionately more female farm workers have a significantly lower percentage of GAECs. A one percentage point rise in the proportion of students in agriculture raises the share of GAEC farms by 0.35 percentage points, while a one percentage point rise in the proportion of women among farm workers lowers the share of GAEC farms by almost one percentage point. Overall, our model explains 82 per cent of the regional variations in GAEC proportions.

In sum, the departments which tend to have a larger percentage of GAECs are those which were historically dominated by middle-sized farms (rather than very small or large farms); whose local ecological conditions favoured labour-intensive animal breeding, especially pastures; whose economic and social conditions are conducive to cooperation (less economic inequality and a greater presence of institutions that promote community cooperation); and which have a greater presence of students in agriculture and a lower presence of women among farm workers.

These results illuminate not only many of the conditions favourable to the emergence of group farming in France, but also some of the conditions under which such farmer cooperation could take root in other (including developing) countries, subject to context-specific modifications of the French model.

5. Some lessons

What lessons can we draw from this analysis for France, and for Europe more generally? Our analysis suggests, first, that group farming will tend to find more fertile ground in regions which have less overall economic inequality, a larger percentage of farms historically in the lower-middle size range, and more social institutions which promote community cohesion/cooperation.

Secondly, cooperative ventures are more likely to be sought for those agricultural activities that require intensive labour inputs *on an everyday basis*, such as cattle breeding (for milk or meat). Hence group farms are more likely to emerge (or take root more easily if promoted) in ecological zones that have a high incidence of permanent pastures, or where other types of farming are less profitable, as in harsh mountain areas or zones with poor quality land. Since crops require less intensive labour inputs on a regular basis than animal breeding, they can also be managed effectively by individual families, with peak requirements being covered by hired labour and machines. Here there would be less incentive to undertake group farming.

Thirdly, to attract small farms to group farming, a GAEC model which allows some non-farm activity and earning options may be a more suitable model which could be considered, both in France and elsewhere (as further elaborated in Part IV of this Report). This would also enable GAECs to overcome some of the financial constraints and crises they report facing.

PART II

THE PRIMARY SURVEY ANALYSIS Institutional and Economic: quantitative and qualitative

Bina Agarwal

1. Background

In order to study the functioning of GAECs in-depth, beyond the macro-analysis presented in Part I of this Report, and to compare GAECs with the functioning of individual family farms, a field survey was conducted in 60 GAECs¹⁰ and 60 individual farmers (as a control sample). Most of the sample fell in two departments—Ain and Saône-et-Loire. These departments had a concentration of GAECs, and a sufficient presence of farmers undertaking the three types of principal activities: milk, meat or crops. The idea was to select equal numbers of GAECs and individual farmers, for each of these three activities. In addition, we wanted to sample both those GAECs constituted of family members only and non-family/ mixed member GAECs. However, due to the non-availability (in terms of activity) of particular categories of GAECs in Ain and Saône-et-Loire, we had to extend the geographic reach of the sample to some neighbouring departments for a few GAECs and individual farmers.

The survey involved several steps: selecting and training the research assistants; preparing the questionnaires; sample selection; obtaining names and contact details of the selected GAECs and individual farmers from the Ministry of Agriculture, Agri-Food and Forestry in Paris; field-testing and modifying the questionnaires after pilot testing them; supervising the interviews undertaken by the research assistants via periodic visits; training new research assistants to replace those who left mid-field; reviewing the research documentation; and providing detailed comments to the research assistants for clarification, correction, and gap filling.

2. Sample selection

A random sample was selected, stratified by (a) the nature of activity, with equal numbers undertaking principally milk, meat, or crop production; and (b) by social composition—family and non-family/mixed—in equal number within each activity. We only sampled GAECs with three or more associates, given our particular interest in understanding cooperation between associates, for which two associates would have been inadequate. The distribution of GAECs across the two departments was sought to be proportionate to the total GAECs in the selected departments (namely 60% in Saône-et-Loire and 40% in Ain). In addition, we planned six detailed ethnographic surveys on GAECs with special features, wherein the four research assistants would each spend one week per case, to directly observe farming practices and processes of interactions between the associates.

Since farm-level information is not available in the public domain, the sampling was done with the help of our contacts in the Ministry of Agriculture, Agri-Food and Forestry in

¹⁰ One more was added in the analysis based on Agarwal's independent interview.

Paris, using the 2010 agricultural census. We were given farmer contacts for the randomly selected sample of GAECs based on our criteria. However, the 2010 list needed updating with the help of the departmental *Chambre d'agriculture*, since many addresses and phone numbers were obsolete by 2015 when we began the survey. This took additional time.

Individual farmers were to be similarly interviewed based on a different questionnaire. We received the sample lists for individual farmers only after we were several weeks into the research, due to delays caused by the physical relocation of the officials from the Ministry of Agriculture. Hence these individual farmer interviews had to be conducted *after* the GAEC interviews, rather than in parallel in each location, as was initially planned. Also, unlike with GAECs, *Chambre d'Agriculture* at the department level did not possess comprehensive lists of individual farmers. And many had to be located through our GAEC contacts or via other individual farmers, using a snowballing technique. This too extended the survey time.

In general, interviewing the GAEC associates took longer than anticipated, since sometimes the farmers asked the team to return on another day to complete the survey, whereas we had allotted only one day per GAEC visit in our proposal. In several cases, GAEC members were not available for an entire day of interviewing and the research assistants had to return later. One research assistant had to be substituted mid-way, and the initial four research assistants could not complete the full sample, requiring the hiring and training of a new one to complete the work.

The data collected required substantial gap-filling, cleaning before coding, and computerisation for analysis by Agarwal.

3. Results

The survey provides us details of the history of how GAECs were formed, the characteristics of the associates, their methods of functioning (labour sharing, decision-making, etc), and of dealing with differences, the kind of agriculture they practice, the new practices they have introduced, the crises they have encountered and overcome, the support they receive from the government, and their broad economic outcomes in terms of gross returns and profit and loss. It also provides us information on what the GAEC associates perceive to be the advantages and disadvantages of being in GAECs compared with Individual farms.

None of these aspects are covered by the macro-data available in the agricultural census which we used for the analysis in Part I. The survey analysis thus complements the macro-analysis in critical ways. In addition, the survey covered a comparative sample of individual farms which were asked many of the same questions. Hence, comparative results for individual farms and GAECs are presented alongside.

3.1 History and associate characteristics

How did most GAECs start? Were they individual farms earlier? Who initiated them? Given the purposive nature of sample selection, half of the GAECs are entirely family GAECs, and most of the rest are a mix of family and non-family members, with only 10% being constituted entirely of non-family members (Table II.1). In terms of activity, although

Table II.1: Type of GAEC

	Mainly Crops	Mainly Milk	Mainly Meat	Mixed farms	Total
Family	50.00 (9)	57.89 (11)	56.25 (9)	12.50 (1)	49.18 (30)
Non-Family	5.56 (1)	15.79 (3)		25.00 (2)	9.84 (6)
Mixed	44.44 (8)	26.32 (5)	43.75 (7)	62.50 (5)	40.98 (25)
Total	100 (18)	100 (19)	100 (16)	100 (8)	100 (61)

we sought to have an equal number of GAECs in each case (namely 20 each), on the ground a number of GAECs were found to be doing mixed farming, usually with two dominant activities rather than one.

In terms of origin, in just over half (54%) of our sample, GAECs said they were earlier individual farms, while the rest were GAECs already. Some 85% were initiated by family members across two or three generations, such as parent(s) and son(s), or a grandparent, parent and son, or brothers and cousins, or uncles and nephews; and a small percentage were initiated by a husband and wife with in-laws or non-family members. Over time, GAECs tend to change in associate composition with retirements, replacements, and/or the addition of new associates. Most have grown in size by adding land and buildings, but very few have changed back to individual farms.

In contrast, the individual farms in our sample were mostly started by the farmer inheriting the farm and buying out siblings, or buying another farm, or leasing in land and setting up a new farm. Over time they have also expanded in area but still remain much smaller than GAECs. The farmers in both GAECs and individual farms – over 75% – grew up on farms, with parents and family members who were also farmers.

The majority of GAECs (some 67%) have three associates, and most of the rest have 4 or more associates, since one criteria for sample selection was the GAEC having at least 3 associates. However, we found during the survey that three GAECs had only two associates since one had left in the interim. For individual farms, the family members who are working on the farms are being counted as associates, and they are included in the characteristics that are presented here.

Farming in France remains a predominantly male activity (Tables II.2 and II.3). Some 54% of the GAECs have no women associates, and those that do have at most one, although some 70% of the associates are married or in PACS with women. Only 15% of all associates across the 61 GAECs are female; Also, 35% of the 31 women associates (out of a total of 206 associates across the sample) the women are doing the farm's account-keeping rather than farming. Individual farms are somewhat more gender-balanced: here a quarter of the family farm workers are women, but again 28% of the women are doing account keeping rather than farming, and among the rest five are heads of the farm and the household, while the rest are wives of the male farmers and two are daughters.

In the case of GAECs, one reason for women's low presence lies in the law which barred GAECs to be formed by spouses alone until 2010. But a more basic reason for women's limited numbers in both GAECs and individual farms lies in a general pattern of women moving out of agriculture in France (and in Northern Europe more generally), since even in our sample of individual farms there are few women. This masculinization of agriculture (as we might term it) is a peculiarly North European [and South and North American](#) pattern, in contrast to a feminisation of agriculture in other parts of the world,

especially in developing countries where men more often than women are the first to move to non-farm jobs.¹¹

The average age of GAEC associates, like that of individual farmers, is 46, but the age range is wide, varying between 22 to 70 years for GAECs and 16–76 for Individual farmers. Notably, a smaller percentage of GAEC associates relative to individual farmers are unmarried (20% for the former and 30% for the latter: Table II.4).

Table II.2: GAECs by number and gender of associates

Number of associates	Mainly Crops	Mainly Milk	Mainly Meat	Mixed farms	Total
Number of GAECs with given number of associates					
2	11.11 (2)	5.26 (1)			4.92 (3)
3	77.78 (14)	63.16 (12)	75.00 (12)	37.50 (3)	67.21 (41)
≥ 4	11.11 (2)	31.57 (6)	25.00 (4)	62.50 (5)	27.87 (17)
Number of GAECs with given number of female associates					
0	66.67 (12)	47.37 (9)	43.75 (7)	62.50 (5)	54.10 (33)
1	33.33 (6)	42.11 (8)	50.00 (8)	37.50 (3)	40.98 (25)
2		10.53 (2)	6.25 (1)		4.92 (3)
Total	100 (18)	100 (19)	100 (16)	100 (8)	100 (61)

Table II.3: Gender of associates and family workers: GAECs and individual farms

Gender	Mainly Crops	Mainly Milk	Mainly Meat	Mixed farms	Total
GAECs					
Men	89.7 (52)	81.5 (53)	81.5 (44)	89.7 (26)	85.0 (175)
Women	10.3 (6)	18.5 (12)	18.5 (10)	10.3 (3)	15.0 (31)
Total	100.0 (58)	100.0 (65)	100.0 (54)	100.0 (29)	100.0 (206)
INDIVIDUAL FARMS					
Men	74.1 (20)	85 (27)	72.5 (29)	66.7 (2)	75.7 (78)
Women	25.9 (7)	18.8 (6)	27.5 (11)	33.3 (1)	24.3 (25)
Total	100.0 (27)	100.0 (32)	100.0 (40)	100.0 (3)	100.0 (103)

Table II.4: Marital Status of GAEC associates and Individual farm farmers

Marital status	GAECs	Individual farms
Married	68.69 (136)	64.5 (60)
Unmarried	19.70 (39)	31.2 (29)
Widow + Divorced	4.5 (9)	1.1 (1)
PACS (legal non-marital partnership)	4.0 (8)	
NMP (informal non-marital partnership)	3.0 (6)	3.2 (3)
	100.0 (198)	100.0 (93)
No Information	(8)	(10)
Total	(206)	(103)

¹¹ Agarwal, Bina (2014). 'Food Security, Productivity and Gender Inequality', *Handbook of Food, Politics and Society* (New York: Oxford University Press).

Both GAEC associates and individual farmers have broadly similar levels of education, although the family workers of individual farmers have a slight edge over GAEC associates, with more of them having finished high school supplemented by diplomas (Table II.5)

Table II.5: Education level of GAEC associates and individual farm farmers

Education level	GAEC associates	Individual farmers
Technical diploma, middle school, less than high school	37.9 (69)	29.4 (25)
High School or less than high school+ diploma or High School (vocational) + diploma	24.2 (44)	28.2 (24)
High School alone or with diploma/technical diploma	35.2 (64)	38.8 (33)
BA,MA or more	2.7 (5)	3.5 (3)
	100.0 (182)	100.0 (85)
No information	(24)	(18)
Total	(206)	(103)

But GAECs, as may be expected, have much larger farms in terms of area (Table II.6). The average GAEC has around 300 ha,¹² the largest being 900 ha, while individual farms are 100 ha or less, and one is barely one ha in size. GAEC land is, however, typically broken up into many parcels: in one case the GAEC has as many as 110 plots, leased in from a wide range of landowners. Leasing in France is typically for nine years, renewable. This is a sufficient period to provide security of tenure.

Table II.6 Land Area: GAECs and Individual Farms, 2016
(owned and/or leased-in) (hectares)

Type of farm	Mainly Crops	Mainly Milk	Mainly Meat	Mixed farms	Total
GAEC Mean ha	317.70 (18)	220.21 (19)	365.56 (16)	353.21 (8)	304.54 (61)
GAEC area range	127.34 – 880	45 – 441	195–990	102–500	45–990
Individual farm Mean ha	112.52 (14)	91.37 (22)	105.51 (22)	46.00 (3)	99.09 (61)
Individual farm area range	40–197	18–285	34–213	0.98–97	0.98–285

Note: Figures in brackets give the number of farms

3.2 Functioning: decision-making, conflict resolution

A critical part of collective action for group farming is decision-making on various counts, such as the division of activities and labour, and resolving conflicts or disagreements. Table II.7 gives the ways in which decisions are made among GAECs. Normally we would expect them to have more formal than informal mechanisms of making decisions, since several

¹² This size is larger than that noted in Part II for France as a whole in 2010. Our data, although for a smaller region, relates to 2016 and indicates that GAECs continue to increase in size over time.

people are involved in decision-making, and some of them can be non-family members. In contrast, in individual farming, the farmer may take a decision alone, or at most consult one or two other members: hence here, we expect decisions to be made informally.

Table II.7: GAEC Decision-making

Type of Decision	Method of Decision-making				
	By rule book	Regular meetings	Informally	Regular + informal	Cases with information
Labour sharing		10.34 (6)	81.03 (47)	8.62 (5)	100 (58)
Investment		17.54 (10)	68.42 (39)	14.04 (8)	100 (57)
Hiring labour	1.92 (1)	11.54 (6)	76.92 (40)	9.62 (5)	100 (52)
Taking new associates	1.89 (1)	15.09 (8)	71.70 (38)	11.32 (6)	100 (53)
Collective engagements outside GAEC		7.27 (4)	85.45 (47)	7.27 (4)	100 (55)
Any other matter			96.30 (26)	3.70 (1)	100 (27)
Total	0.66 (2)	11.26 (34)	78.48 (237)	9.60 (29)	100 (302)

Note: Figures in brackets are the number of GAECs using a given method of decision-making.

Although this hypothesis is borne out for individual farmers, the picture for GAECs is much more complex. To begin with, few use a regular decision-making forum and most decisions are made informally. It is especially surprising that some 71% of our sample of GAECs report taking new associates through informal processes. A possible explanation for this could be that decisions on new associates are rarely taken in one sitting. The most important factor mentioned was familiarity with the person they take as a new associate. The person who joins is thus likely to be relation, or someone known to the associates because he/she has worked on the same GAEC for a while as an apprentice/trainee, or a neighbour. Hence the idea of taking on a particular person as an associate is more likely to evolve over time, including negotiation with the person concerned on the terms of joining. More generally, although not many GAECs report having regular meetings, many do report that they meet regularly over morning coffee, in some cases every day.

The terms under which a new associate joins can vary: associates bring in new or complementary skills, or a new activity, or land, or financial resources to buy a share. The person's temperament also matters a great deal (some 30% of the GAECs mentioned this) some of the traits commonly considered desirable are: hardworking, motivated, independent, dynamic, having similar interests as the existing associates, and so on.

Notwithstanding their common interests, however, disagreements and conflicts are an inevitable part of collective functioning, and the survival of GAECs can depend on how they deal with situations of conflict. Although there can also be disagreements in individual family farming, these are likely to be relatively fewer, given that only one or two family members tend to be workers on the family farm.

Among GAECs, disagreements are reported in our survey to revolve particularly around activity divisions and agricultural processes – these account for a third of all conflicts. There are also some cases of associates being consistently absent which are dealt with by calling in replacement services or relatives. But on occasion the person can be penalised by

the GAEC in terms of withholding the monthly payment. (I never encountered this!)

Occasionally an associate may even leave the GAEC as a result of the discord.

Mis en forme : Surlignage

Most of the conflicts are resolved within the group, but in complex situations outside mediators can also be called in. Indeed, the Ministry of Agriculture has a branch which provides formal training to those planning to create a GAEC (including on psychological aspects of relationships, perhaps not unlike pre-nuptial counselling). The Ministry also has consultants whom GAECs can call upon for help in resolving conflicts. Private consultants with training and long experience provide a similar service. Interviews by Agarwal with the latter suggest that unless the consultant is called early on, by the time outside mediation is requested the conflict has often reached a point where reconciliation is not possible, and the consultant's efforts are then to ensure a non-acrimonious split.

3.3 Agricultural practices and innovations

When asked what kind of agriculture they practiced, two thirds of the GAECs said they were doing "reasonable" agriculture, by which they meant trying to reduce chemicals but not going totally organic. Most of the rest did conventional farming and rather few did organic. In contrast, although individuals also largely reported doing reasonable or conventional farming, a fair proportion of crop cultivators had gone organic.

What about experimentation with new practices? We would expect GAECs to be in a better position to try out new practices than individual farms, both because GAECs are larger, more able to take risks, and because they would have a wider range of skills among the associates than are likely to vest in one individual farmer or one family. And 92% of GAECs indeed reported using new practices in milk and meat production.

Among the new practices mentioned by several crop farmers was crop diversification and introduction of new crop varieties. Among milk farmers the shift was (a) towards technology to helping in milking (e.g. robots) and reducing the use of chemicals, antibiotics and allopathic medicines. Among meat farmers, again, the new practices most often mentioned were the use of technologies for better reproduction (artificial insemination, genotyping, hornless gene, predicting calving cycles, easing births by birth belts, etc.) followed by methods of improving diets for the animals. (TABLE II.8). Individual farmers also mentioned crop diversification, and moving toward less ploughing and organic farming. But there was less mention of expensive technologies for animal farming (milk or meat), probably because they were too expensive and non-viable in smaller farms (Table II.9)

Most said they learnt these new practices in crops from cooperatives and other farmers and in the case of milk and meat farming they also learnt from the internet, magazines. Some have taken training in artificial insemination and other techniques.

Individual farmers, however, are also moving towards similar practices on many counts. The crop farmers, for example, also focus on low tillage, more organic varieties; the milk farmers report using less antibiotics and alternative medicines; methods of improving breeds. But in contrast to GAECs, the individual farmers are into lower level technologies such as cameras for watching the cows, rather than high tech (none mentioned milking robots, for instance).

II.8: New Practices tried by GAECs

Experiment with new practices	Perceived benefits from these practices
CROPS (7 GAECs)	
Direct seeding rather than traditional ploughing, simplified Ploughing, or soil preparation without ploughing; strip till	Helps soil conservation, and reduces labour
Diversity in production and crop rotation: adding clover with barley, Durum wheat	Spread risk through the year, increases production
Use GPS on pesticide sprayer	Reduces pesticide use
Use of Stripill (technique to apply manure to the plant roots and not the soil)	Reduces manure and fuel use
Hybrid varieties of barley, maize, other crop rotations	Less disease, higher yields
Use of drone	To evaluate potential of each plot and sow accordingly
MILK (9 GAECs)	
Vaccination	Reduces antibiotic use
Milking Robots	Reduces daily labour in milking. Robots also detect heating, control disease, and are sanitary and efficient
More homeopathic and osteopathic practices to feed cows	More convenient and respectful towards animals
PRP technology for working on soil, plants and breeding	More efficient, reduces pests etc.
Sexed semen	Adds value to male calves, improves animals, and helps get a good price on sale of animal
Reduced use of chemicals by 50%	Free time and savings
Use more clover and less nitrogen in farming	Saving on cost and time
MEAT (14 GAECs)	
Use of new technology (including special thermometers) to predict calving cycle	More precise use of time, more free time
Wooden animal housing buildings	More hygienic
Artificial insemination; genotyping	Increases genetic potential of animals
Special diet to herds, including selenium, magnesium	Improve digestion and health of cows
Use of video cameras	Easy to watch pregnant cows
Special birth belt	Protects cows in birthing

II.9: New Practices tried by Individual farms

Experiment with new practices	Perceived benefits from these practices given by the farmers
CROPS (13 farms)	
Stopped ploughing, no tillage; plough less of the land; uses strip-till; examine effect of ploughing to different depths	Respects nature, more cost effective
Sowed clover within cereals to stop weeds	Stops weeds
Move to organic (carrots, beetroot); uses green fertilizers (oats-clover mix)	Better prices & more demand for our crops; lower input cost; more agro-ecological practices
New wheat variety to avoid blight	Reduces crop losses
Soil analysis by satellite photos (to assess fertiliser needs)	Decreases fertilizer use
Planting trees for agro-forestry	Improves the soil
Trichogram (small flies in capsules) in maize against the Pyrale	–
MILK (14 farms)	
Vaccination and new medical practices; learning homeopathy; using essential oils instead of antibiotics	Improved health of animals, less use of antibiotics
Artificial insemination, cross breeding of cows, sexed seed on heifers	Better milk production, able to export heifers
Farming organic, changed the feed type	Good price for milk
Varied milking timings	Reduce stress on cows
Pipeline; Automatic washing	Saves time
Spread calving over the whole year	Better health of animals; more milking periods; spreads work load
MEAT (19 farms)	
Vaccination	Less antibiotic use
Natural insemination	
Changing the feed to organic, more pasture, non-GMO feed, Giving minerals individually to each cow	Less intensive, less inputs, better for animals
Oligo-elements	Avoid calving problems; Gives better milk
Cross breeding (Limousin–Charolais)	Light carcasses sell well (Limousin-Charolais cross are smaller); less monitoring during calving
OBIONEC (product that helps calves to digest)	Less losses on calves
Camera to monitor calving	More comfortable and quicker to check on cows
Genetic improvement by buying embryos	Better prices

3.4 Support from government or the Chambre de agriculture

Did being in a GAEC give the associates more bargaining power in contrast to an individual farmer, in getting support from the Government or the Chambre de Agriculture? Going by their reports, this does appear to be the case. Most GAECs reported getting financial, technical or legal support and often all of the above, while rather few individual farmers reported getting such support. Both types of farms, however, had their wish list of the kind of support they would like. GAECs wanted fair prices and a large number had lobbied for these, apart from lower taxes. Individual farmers similarly wanted better prices and lower taxes, and more “neutral” support from the Chambre de Agriculture.

Most GAECs and individual farmers are members of CUMA (cooperatives set up especially for hiring large machines) and many use them. But they also cite problems of not getting the machines in time when they need them, or finding that the machines were not well maintained. Bigger GAECs are able to buy their own machines. Individual farmers also use CUMA, but are rarely big enough to find it economical to buy their own machines.

Hence overall, individual farms are disadvantaged in their ability to expand their farms in terms of land area or size of animal herds, or invest in large machinery, or easily get labour replacement, diversify activities including producing supplementary by-products, or invest in as many new farming practices, especially technology-related. They have an advantage over GAECs, however, in not having to deal with potential conflicts among associates.

3.5 Economic returns

We have assessed economic returns on the basis of reported EBE (gross returns per farm) and profit and loss (“*bénéfice ou perte*”). Where possible, these were obtained from written returns filed by the GAEC for tax purposes, but some provided information from their private records. Rather few GAECs refused to share this information. Hence, we are missing information for only very few. We did the same for individual farms, but here we had many more cases of missing information (about a quarter for EBE and a fifth for profit and loss). Some farmers did not have any records (some were too small perhaps) and a few did not want to share their records.

EBE per farm and per hectare

As seen from Table II.10, some 93% of the GAECs and 91% of individual farms across all activities report positive gross returns (EBE) per farm. The size of the mean gross returns per farm is several times higher for GAECs than individual farms, understandably since GAECs are involved in much larger economic operations, but the per hectare EBE is somewhat higher in individual farms.

In terms of differences in EBE per ha between GAECs specialising in different activities (Table II.11), milk GAECs have the highest values, but the differences are not statistically significant between them and crop and meat GAECs. In Individual farms, again, milk farms have higher EBE per ha than either crop or meat farms, but here the differences between the latter two and milk farms *are* significant at 5%. Moreover, comparing GAECs and individual farms, activity by activity, the differences are not significant, but individual farms perform somewhat better if we take farms of all three specialisations together.

Profits per hectare

Now consider profits per hectare (Tables II.10 and II.12). Only 52% of the GAECs report profits per ha relative to 88% of individual farms. The per hectare profits are also much lower in GAECs relative to individual farms, being especially low in mixed activity GAECs. Different activity GAECs (crop, milk, meat), however, are not statistically different from one another in profits per hectare, nor are different activity individual farms. Similarly, comparing GAECs and individual farms, activity by activity, the profits per ha do not differ significantly. The only statistically significant difference is when GAE and individual farms of all three specialisations taken together are compared – here individual farms do better.

Table: II.11 EBE per hectare comparisons: GAECs and Individual Farms

Farm type	EBE per hectare (Euros)		Pairs compared	differences	t-values
GAEC					
• Crop	293.82 (18)		Crop-milk	-136.63	-1.09
• Milk	430.45 (17)		Crop-meat	20.19	0.26
• meat	273.63 (15)		Milk-meat	156.82	1.24
INDIVIDUAL					
• Crop	363.59 (11)		Crop-milk	-206.9366	-2.28**
• Milk	570.53 (16)		Crop-meat	-0.01589	-0.0002
• meat	363.61 (16)		Milk-meat	206.9208	2.86**
GAEC & indiv	GAEC	INDIVIDUAL	compared	difference	t-values
• Crop	293.82 (18)	363.59 (11)	Crop (GAEC)- Crop (indiv)	-69.77071	-0.68
• Milk	430.45 (17)	570.53 (16)	Milk (GAEC)- Milk (indiv)	-140.0803	-1.13
• Meat	273.63 (15)	363.61 (16)	Meat (GAEC)- Meat (indiv)	-89.9749	-1.25
All 3 activities	334.21 (50)	440.59 (43)	All 3 activities (GAEC) – all 3 activities (Indiv)	-106.37	-1.75†

Values in brackets are number of observation. *t*-values significance † close to 10%. ** at 5%

Table: II. 12: Profit Per Hectare (Euros): GAECs and Individual Farms

Farm Type	Profit per hectare (Euros)		Pairs compared	differences	t-values
GAEC					
• Crop	57.39 (18)		Crop-milk	1.74	0.01
• Milk	55.65 (17)		Crop-meat	3.26	0.05
• meat	54.12 (16)		Milk-meat	1.52	0.01
INDIVIDUAL					
• Crop	130.53 (10)		Crop-milk	-138.01	-1.62
• Milk	268.53 (20)		Crop-meat	-5.94	-0.07
• meat	136.47 (16)		Milk-meat	132.06	1.67
GAEC & indiv	GAEC	INDIVIDUAL	compared	difference	t-values
• Crop*	57.39 (18)	130.53 (10)	Crop (GAEC)- Crop (indiv)	-73.13	-0.94
• Milk	55.65 (17)	268.53 (20)	Milk (GAEC)- Milk (indiv)	-212.89	-1.65
• meat	54.12 (16)	136.47 (16)	Meat (GAEC)- Meat (indiv)	-82.35	-1.25
ALL	55.78 (51)		All 3 activities (GAEC) – all 3 activities (Indiv)	-132.81	-2.37**

Values in brackets are number of observation. *t*-values significance: ** 5% level

Monthly payments

The monthly payments per associate, however, are higher in GAECs than individual farmers, being 1440 euros on average among the former and 1000 euros among the latter. Again this is as may be expected, since GAEC associates are not allowed to take up non-farm work, while individual farmers can do so.

Although in principle all GAEC associates are seen as equal and this principle is emphasized both in the legal rules of establishing GAECs and by associates, in practise there are sometimes differences between associates in monthly payments for several reasons. The most important reason reported for unequal payments is unequal time spent in GAEC work. A second reason is adjustments made according to different household needs. Also women doing GAEC accounting work tend to do so part time, and are thus paid less.

3.6 Crises

Both GAECs and individual farmers reported facing a crises at some point (81 % of the former and 71% of the latter reported this). And in both cases we note from Tables II.11 and II.12 that financial difficulties is the most important cause, in many cases related to natural disaster or (for animal farming) disease.

Table II.11: GAECs facing crises

	Mainly Crops	Mainly Milk	Mainly Meat	Mixed farms	Total
GAEC's that reported a crises	70.6 (12)	84.2 (16)	81.2 (13)	100 (8)	81.7 (49)
<i>Type of crisis</i>					
1 Financial	41.7 (5)	37.5 (6)	38.5 (5)	50.0 (4)	40.8 (20)
Linked: financial +more	8.3 (1)	5	2	2	20.4 (10)
2 Conflict	(2)	12.5 (2)	7.7 (1)	1	(6)
3 Natural calamity or 4 disease	(4)	6.25 (1)	(5)	12.50 (1)	(11)
5 Others		12.50 (2)			4.1 (2)
Total	100 (12)	100 (16)	100 (13)	100 (8)	100 (49)@

Note: @ Number of GAECs reporting a crises.

Table II.12: Individual farmers facing crises

	Mainly Crops	Mainly Milk	Mainly Meat	Mixed farms	Total
Farms that reported a crisis	50.0 (6)	79.0 (15)	73.7 (14)	100.0 (2)	71.2 (37)
<i>Type of crises</i>					
Financial	66.7 (4)	66.7 (10)	42.9 (6)	100.0 (2)	59.5 (22)
Financial related		6.7 (1)	28.6 (4)		13.5 (5)
Natural calamity and/or disease	16.7 (1)	6.7 (1)	21.4 (3)		13.5 (5)
Other	16.7 (1)	20.0 (3)	7.1 (1)		13.5 (5)
Total	100.0 (6)	100.0 (15)	100.0 (14)	100.0 (2)	100.0 (37)@

Note: @ Number of individual farms reporting a crises

4. Advantages and disadvantages of being in GAECs vs Individual farms

So why do people remain in GAECs or join them? For many it is not an active choice. They continue in farms they were born in—GAEC or family farms.

However, when asked about the advantages of disadvantages of the two farm types, they do have strong opinions. The most important advantage is seen as work sharing, followed by the opportunity a GAEC provides to young farmers to start farming with less investment or equipment than needed for an individual farm, the ability to diversify activities, and the ability to induct a diversity of skills. The disadvantages relate to the lack of autonomy of being a boss, of greater time taken in decision-making since others have to be consulted, and the problems that can arise with disagreements and with relationships, namely the standard problems of collective action.

GAECs felt that the most important factor that would make for success was good relationships, an ability to get along and compromise when needed, similarity in views, good communication, and overall agreement in ways of functioning. Also there was a recognition that if the GAEC was making money and was profitable it would help sustain it. Associates who had thought of leaving the GAEC pointed especially to poor economic results and difficult relationships.

We also asked their perception of the pros and cons of family vs non-family GAECs. Family GAECs were seen as advantageous on some counts and disadvantageous on others. The advantages lay in greater trust and solidarity among associates, ability to make decisions more easily and also make peace during disagreements more easily, while the disadvantages were seen to lie in intrusion of worklife into family life, being more argumentative (no holds barred), etc. Including women was again seen as double edged. While having more women was seen as likely to be beneficial by many, including wives was seen by the majority as likely to prove detrimental, due to the difficulty of taking family holidays if both partners were farm associates, and the likelihood of personal issues and dynamics impinging into the work space. These were also among the reasons given by GAEC and Societies to bar spouses from forming GAECs until 2010 when they gave into demands from many women farmers to allow spouses to form GAECs.

On the future of sons and daughters again, there were again mixed views. While most GAEC associates felt that it was not a problem, indeed it could even be beneficial, fewer individual farmers felt so. Interestingly more of the latter favoured their sons becoming farmers, but were less positive about daughters taking up farming.

PART III. SURVEY DATA ANALYSIS

Anthropological aspects

Birgit Muller

In addition to the data we collected for quantitative analysis, Birgit Müller and the research team conducted six field studies of one week each, in six chosen GAECs, two for each GAEC activity (Milk, Meat, Crops). Birgit Müller's analysis of the survey data and the fieldnotes refer exclusively to the French farming context.

1. Background

The hallmark of anthropology is the exploration of the complexity and nuances of human interactions and experiences. As a research discipline, anthropology combines humanist and social science strategies and sets them in their historical and political context. The method that sets anthropology apart from other disciplines is participant observation, the qualitative process of exploring in depth the whys and hows of human practices, behaviours, and expressions. Using this ethnographic method, anthropologists can uncover unexpected insights that are best gained by studying a topic in person, in situ, over time, and from diverse perspectives.

In this collaborative project, however, data had to be collected for quantitative economic analysis. The research assistants were working with the elaborate interview guideline described by Bina Agarwal earlier in this report and documented the results in clearly formatted documents to be used for quantitative analysis. On the positive side, the random selection of cases allowed to obtain material about farms with very different structures, agricultural practices and engagements in agricultural policy making. Conducting participant observation for one week in only six of the GAECs obviously limited the anthropological approach. However, the results obtained are rich and varied and of high relevance for the debates on the future of agriculture raging in France today.

2. Context

The material collected inscribes itself in the current debates in French society about the future of food and farming. The industrial farming system and the food it produces is increasingly rejected as unhealthy and damaging for the environment and contributing to climate change. Consumers want to know where their food comes from and who produced it with which methods. At the same time, farmers have come under the control of ever larger conglomerates — cooperatives or private enterprises — that commercialise their products. Our survey was carried out in the concrete historical context of the end of milk quotas in April 2015 and the sudden drastic drop in milk prices together with a drop in the price of meat. Many milk and meat farms in France were (and still are) in great financial difficulties precisely in the period of October 2015 to October 2016 when the main part of the data collection took place. One of the questions Birgit Müller followed up in the analysis of the material was, had GAECs the potential to be more resilient to market crisis than conventional farms? The answer is complex and multi-faceted and linked to the challenge of farm debt. The other question that the anthropological analysis of the material will try to answer is: How

did farmers use the legal structure of the GAEC and how did the legal frame and regulation of the GAEC model by the French State affect farming practices and economic strategies?

The law creating the legal form of GAEC (Groupement Agricole d'Exploitation en Commun = Agricultural Group with Common Operations) in 1962 attempted to unite opposites establishing a collective whose members remained individual entrepreneurs. The individuals joining the GAEC maintained their individual right to receive subsidies and claim tax breaks. Each associate remained an individual farmer in the eyes of the State — a condition designed as "transparence". This means, it remained clear, "transparent" that two or more independent farmers had chosen to work together. In theory, this cooperation could be cancelled at any time and each would go again his/her own way. Farmers who joined were to rent their assets in land, machinery and livestock for a fixed rate of return to the group farm GAEC. Only if they worked exclusively on the farm could farmers remain GAEC members. In most GAECs we studied associates were paid according to the labour invested, sometimes also according to the number of capital shares, and rarely according to need. The profit of the entire farm was redistributed to the members, not the result of each field or speciality. The farmers could thus spread the risks and share the benefits of their collective endeavour and diversify their agricultural activities. Being part of a GAEC allows the individual associate to separate his/her private estate from the farm. However, the protection of the individual estates in the GAECs are not as strong as in other agricultural corporations with limited responsibility, like the EARL or SARL. If a GAEC fails, the associates are financially responsible with up to twice their share in the capital stock.

3. Results

One of the results of the comparison between the sample of individual farms¹³ and GAEC group farms is that on average the indebtedness of group-farms is far higher per farmer than the indebtedness of individual farms. In the French statistics on farm debt GAECs are counted as *one* farm (exploitation agricole) in spite of the fact that several independent entrepreneurs with their own subsidies and tax break cooperate here. GAECs with more than 250 000 euros of operating income per year — which is the case of most of the GAECs we studied — are counted in the French statistics among the "very large farms". "Very large farms" in France are heavily indebted and so are the GAECs. In 2016 "very large farms" carried on average 485000 euros of debt. The questions Birgit Müller dealt with are: why did many GAECs get into so much debt? What does that debt level do to the farming practices, to the ways in which the farmers can take care of the soil and the farm animals?

3.1 Legal constraints

Before the Law for the future of agriculture (la loi d'avenir agricole) of the 13 octobre 2014 changed the conditions, each farmer who wanted to become part of a GAEC had to fulfil two conditions. He/she had to show that he/she will be able to gain the legal minimum salary (SMIC 1150 euros net in 2014) with his/her farming activity and was contributing a minimum amount of rented or owned land (SMI surface minimum d'installation). The GAEC Departmental Accreditation Committee (CDA) provided an assessment of the ability of the person to associate in GAEC, in terms of his/her professional project, financial and personal

¹³ The average size of the individual farms in our sample is 99 ha in our sample while the national average was 63 hectares in 2016. (Agreste Primeur, Nr. 350, juin 2018)

commitment and willingness to work together in the group in an effective and efficient manner. As the farm histories collected show, the size of the farming operation increased with each new associate. The legal frame pushed GAECs to grow even faster than individual farms.

This might have changed since the reform of 2014, that responded to criticism formulated by the European Court of Justice that judged the GAECs non conform with the principles of the Common Agricultural Policies. Since the reform of the legal frame regulating GAECs the incoming partner still has to make capital contributions to the group, either in the form of contributions in kind (movable or immovable property: livestock, equipment, land, buildings, etc.) or in the form of contributions in cash, but he/she no longer has to bring in new land, or to prove that he/she will be able to earn the minimum salary. Only GAECs that distribute shares equally to its members can claim European subsidies for all of them. The intervention by the European Institutions thus encouraged GAECs to grow less fast and adopt more egalitarian principles among its members.

3.2 Farm Debt

Farm debt in France has increased tremendously in recent years. In 2010, the indebtedness of farms covered by the Farm Accountancy Data Network amounted to 159,700 euros as a national average. In 2016 the debt on average per farm had increased to 191,880 euros.¹⁴ Between 2000 and 2010, the Saône-et-Loire lost 28% of its farms and 1.4% of the area occupied by agriculture (nearly 710 hectares per year).¹⁵

The level of indebtedness is very variable. In 2010, 30% of farms carried less than 50,000 euros debt, while in 14.4% of farms, the debt level exceeded 300,000 euros. In 2017, 28% of farms, had less than 50,000 euros, while 19% of farms carried more than 300,000 euros¹⁶ of debt. The larger farms account for more than half of the total debt. Among the very large farms, those with a standard gross production of more than 250,000 euros, half have a debt greater than 300,000 euros. Buildings, facilities and equipment are the largest items in fixed assets. The share of land in fixed assets continues to decline in recent years (19% in 2010 against 36% in 1990). The share of land held in assets is reduced.¹⁷

Reasons for GAEC farms to indebt themselves fall into different categories (some of them are common for individual farms as well):

(a). Linked to natural disasters and market crisis

- Crisis due to weather events, animal disease and illness, accidents or death of associates
- Low commodity prices, unfavorable farming contracts,

¹⁴ Rica France - Tableaux standard 2016, Agreste Chiffres et Données Agriculture n° 247

¹⁵ Agreste Nr. 121, novembre 2011

¹⁶ DOI: [<https://zimbra.ehess.fr/service/home/~/?auth=co&loc=fr&id=49218&part=2>]

¹⁷ DOI: [<http://agreste.agriculture.gouv.fr/IMG/pdf/Gaf12p062-065.pdf>] (accessed 19 sept 2019)

(b) Other debts are more or less carefully planned and linked to projections in the future. They are medium and longterm debts contracted to make needed investments or to invest in order to obtain tax deductions.

- Purchase of milk quotas and investments to increase production in order to fill them, such as extremely expensive milking robots
- Investment in expensive farm machinery and new buildings
- The readiness of banks to give them credit even if the level of indebtedness is already very high
- Land purchase
- Purchase of farm animals

(c) GAECs have in addition a propensity to indebt themselves. When members leave and new ones join and production and finances have to be rearranged, parts of old associates have to be reimbursed and production enlarged to accommodate new members.

3.3 Resilience to Crisis

The analysis of the farming strategies of the different GAECs show that their resilience is linked to the complementarity of their different farming activities. GAECs producing mainly crops were less affected by low prices than GAECs producing meat, and especially milk in 2015 and 2016. The most resilient GAECs were those whose activities fell into different OTEX (category of main farm activity) that complemented each other. For example, mixed farms producing chicken protected by the regional label of the Bresse were less indebted than farms producing only chicken or only cereals. Other GAECs were increasing their chances by producing wine and cereals. The least indebted GAEC we encountered was a highly integrated organic farm producing, cereals, vegetables, goat and cow milk and pork meat on 100 hectares providing an income to six people. Milk was transformed on-farm into cheese and the whey was fed to the pigs. The GAEC was also producing bread for sale.

Highly specialized farms producing milk or meat were often the most indebted and prone to crisis, as they were encouraged to invest in large buildings, farm machinery like milking robots. Members of these GAECs expressed their feeling of dependency in terms of: “We are working for the banks”. Indeed by the time the investments were paid for they had already been consumed. The buildings were no longer corresponding to environmental norms, the machines were broken. When asked about the value of their farm, members of these GAECs tended to strongly disagree about the actual value of their farm, some assuming that their farm infrastructure was worth nothing anymore, while others listed the investments in infrastructure without accounting for their devaluation. “All depends on which idiot you ask”, as one farmer summed it up.

Few GAECs or their individual members had been able to invest in land. Many GAECs were mostly renting land from farmers outside of the GAEC, although they had strong tenure security. The legal guaranteed minimum rental period (bail ruraux) even under an oral agreement in France is nine years. However by not owning land few GAEC farmers could participate in the gradual appreciation of land values in France.

The most common reaction to the increasing debt levels was to increase rather than decrease farming activities. In Bourgogne-Franche-Comté, between 2000 and 2016, the average size of the dairy herd increased from 40 to 60 cows and the average delivery from

184,000 liters to 449,000 liters.¹⁸ Low milk prices led to increasing the size of the milk cattle herd, or to going out of milk cattle altogether. As we could observe during our case studies increasing the milk cattle herd had a direct effect on the farm animals. Farmers had no time any more to move the animals out into the pasture and back for milking. Cows were stable-fed rich food to increase their milk production, which led to foot diseases like foot rot and laminitis. A clear tendency emerged out of the interviews we conducted: milk farmers had the tendency to become meat farmers, meat farmers tried to grow more cereals if the quality of their farm land was good enough.

A great limitation for allowing GAECs to get out of debt, is the legal constraint on GAECs to compensate the losses on the farm by outside activities. A GAEC member is not allowed to work more than 536 hours outside the farm. Also, structures of commercialisation set up by GAECs are limited by law, allowing mostly the sale of their own production.

3.4 Direct Selling

In spite of this legal provision, one of the more hopeful aspects of the GAEC model was the growing tendency to engage in directly selling farm products to consumers: 25% of the GAECs we studied, transform and sell one or more of their products directly to consumers. This number is higher than the regional average for all farms. In 2016, 16.5% of non-viticulture operations in Burgundy-Franche-Comté sold directly to consumers, an increase of 4 points compared to the 2010 agricultural census. However, this share is lower than the national average (20%).¹⁹ It is mainly farmers under 50 years of age who practice direct selling.

We were able to observe the tightly knit networks that emerged between GAEC members and other local producers, setting up farm shops, butcheries on farm and cheese dairies. Local farmers mutualized the sale of their products in their respective farm shops, set up small butchering cooperatives and creating new farmers' markets. These multiple activities and relationships were much facilitated by the division of labour on GAEC farms. Many GAEC members were also likely to have been more active than individual farmers in municipal councils, tradeunions, the Chamber of Agriculture, Farm Credit Union (Crédit Agricole), the SAFER, and the committee deciding about the renewal of the GAEC status. Typically, they would thus be better able to influence infrastructural and legal decisions on the municipal, regional and national level encouraging direct sales.

¹⁸ Agreste Bourgogne Franche-Comté, Nr. 58, avril 2019

¹⁹ Agreste Bourgogne Franche-Comté, Nr. 49, November 2018

PART IV

BROAD COMPARISON OF MODELS: FRANCE AND INDIA

Bina Agarwal

Independently and prior to the study of group farming in France, I had undertaken a detailed study in India based on the primary data I had collected in two states, namely Kerala and Telangana.²⁰ In addition, new models of group farming have been emerging in other parts of India.

There are some key differences in the French and Indian models, and also some variations of the models within India itself, as outlined here. The Table IV.1 below gives broad differences between the French and the Indian models of group farming.

Table IV.1: Comparing the French and Indian models of group farming

Characteristic	French model	Indian model
Legal status	Formal, 1962 law	Informal
Group formed of families or individuals?	Individuals. Family members have individual rights as equal partners	Individuals
Ability to take on work outside the group farm	Not allowed	Allowed. Group members can farm their own land alongside, or take up seasonal employment
Government support	Formal and institutionalised	Variable. Institutionalised to a degree in Kerala but not elsewhere
Gender of associates	Predominantly male groups	<ul style="list-style-type: none"> • Kerala: all-women groups • Telangana: all-women groups • East India (North Bengal, Bihar): variable: all-women, all-male, mixed-gender
Land access	Owned or leased. Nine year leases usually renewable	Most groups depend entirely on leased land; leases are usually oral, informal and insecure; only some pool own land, or own any land to pool
Type of farm activity	Milk, meat and crops	Crops
Degree of cooperation	All aspects of GAEC farming	Varies: some models involve fully intergrated cooperation on all aspects of cultivation (Kerala & Telangana); other models involve full cooperation for some crops/seasons, but not for others.
Existence of complementary cooperative institutions	CUMA, cooperatives set up mainly for hiring machines	Limited. In Kerala, Padasekara samitis for lending machines and providing other support to paddy farmers, but not to others.

Sources: Agarwal and Dorin (op. cit). Agarwal (2018, 2019a, 2019b)

²⁰ There are 3 publications from this analysis:

Agarwal, Bina (2018). 'Can Group Farms Outperform Individual Family Farms? Empirical Insights from India', *World Development*, 108: 57-73, 2018.

Agarwal, Bina (2019a). 'Does Group Farming Empower Rural Women? Lessons from India's Experiments', *Journal of Peasant Studies*
<https://www.tandfonline.com/doi/full/10.1080/03066150.2019.1628020>

Agarwal, Bina (2019b). The Interplay of Ideas, Institutional Innovations and Organisational Structures: Insights from group farming in India, ESID working paper number 116.

The most important differences lie in the legal status of GAECs, the treatment of all GAEC associates as formally equal even if they are close family relations, such as father and son, or husband and wife; their formal access to government support; and the bar on associates taking other supplementary employment so that the GAEC alone needs to provide them sufficient returns for a living.

Giving a GAEC's formal status, the access to government support on a continuing and dependable basis, and the formal acceptance of family members as equal partners are all positive lessons we can take from the French experience. However, the inability of GAEC associates to earn a supplementary income from other activities has both positive and negative features. On the positive side, it reduces the possibility of conflicting pulls between say the group farm and the individual family farm, but on the negative side it also restricts the GAEC associates from supplementing their incomes and surviving if faced with a serious financial crisis.

The models within India are varied, and these have economic implications. In Kerala, groups do significantly better than individual family farms in annual value of output per hectare and in net returns per farm (Table IV.2). Groups in Telangana, however do worse than individual family farms in annual value of output but as well in net return especially since they save on hired labour costs. Kerala does much better than Telangana, due to several factors: continued state support, institutional scaling up, focus on commercial crops, small group size, some diversity in the social composition of members, and better ecological conditions for farming. The lessons learnt from Kerala on institutional design can help in replication. In addition, in both states women reported capability enhancement, social empowerment in families and communities, and greater political participation in standing for and winning village council elections.

**Table IV. 2. Telangana and Kerala:
Average value of output per hectare and Average annual net returns per farm (Rs/ha)**

Indicator	Group farms	Individual farms		Pairwise <i>t</i> -tests for difference in means	
Kerala					
<i>Annual value of output per GCA (Rs/ha) (mean)</i>	JLG (69)	JWIF (181)		Pairs compared	<i>t</i> -values
	179,183.70	101,156.20		JWIF– JLG	-3.189***
<i>Annual net returns per farm (Rs/ha) (Mean)^a</i>	121048.5	23578.3		JWIF– JLG	- 4.20***
Telangana					
<i>Annual value of output per GCA (Rs/ha) (mean)</i>	SDG (70)	NGF (485)	SWIF (208)	Pairs compared	<i>t</i> -values
	36,544.37	53,572.97	49,478.03	NGF – SDG SWIF – SDG NGF – SWIF	3.683*** 2.779*** 1.328
<i>Annual net returns per farm (Rs/ha) (Mean)^a</i>	28956.6	26814.8	17355.7	NGF – SDG SWIF – SDG NGF – SWIF	-0.36 -1.84* 2.52**

Source: Agarwal (2019a) based on author's primary survey, for which she collected weekly data for the full calendar year for all the sample farms.

Notes: Figures in brackets give number of observations.

^a Net returns = value of total output minus value of all purchased inputs
t-values, significance: *** at 1%, * at 10%.

PART V

CONCLUDING REFLECTIONS

Bina Agarwal and Birgit Muller

This study has used both a macro analysis of group farming in France and an analysis of in-depth survey data from a sample of departments. The Report also presents some results from an independently done study of group farming in India by the Indian co-PI. Together the material provides diverse reflections and lessons from different elements of the analysis as outlined below.

1. Reflections from Bina Agarwal and Bruno Dorin's macro-analysis

For both France and India, as well as other regions, the macro analysis by Agarwal and Dorin indicates that efforts to promote group farming are more likely to be received favourably in regions of lower economic inequality, and where the local ecology and economy favour labour intensive farm activity, such as animal breeding. Many of the other advantages of group farming mentioned earlier, such as labour sharing, viable farm size, resource pooling for capital intensive investments, and skill diversification would apply as well.

2. Reflections by Birgit Muller from her analysis

The GAEC legislation was a child of the Trente Glorieuses, the era of post-war expansion in France, when the belief in modernisation, industrialisation and growth was unabated. GAECs profited more than any other legal farming structure from European and national subsidies and tax cuts. Today's GAEC associates are struggling with this legacy, as the productivist model of agriculture is in deep social and ecological crisis. In numerous interviews GAEC members expressed their suffering about the increasing economic pressure, the lack of time for their families. The bigger the farm the more difficult it usually becomes to farm it with attention. The result we observed on some crop GAECs were extremely high chemical bills. Also, some milk GAECs which had overextended their herds in order to pay their debt were struck with disease and low quality milk.

At the same time group farming also offers the chance of more flexibility and creativity and the possibility to build on the local and regional level alternative networks, challenging the industrial farming model. The legislation governing GAEC accreditation still has to follow this trend and allow GAEC farmers to exchange and commercialize produce with other farmers, within integrated local and regional food networks. The subsidy structure of French agriculture will have to change to favour labour on farms rather than encourage technological override and continuous growth of farm size and herds. With a change in the legal frame, group farming could then become an interesting option for the future of French agriculture.

3. Reflections by Bina Agarwal from her survey analysis and comparisons with India

France offers a unique model of group farming, the GAEC, legally enshrined and stabilised as a third path to family farming and corporate agriculture, which would allow for

agricultural modernisation while also being embedded in communities. But variations on this model might emerge even in France, if some of the stringent legal requirements for forming GAECs were relaxed. In terms of constraints, for instance, GAEC associates need to pool all their productive resources and work full time on the farm (with a limited number of hours allowed for outside work per year with authorisation). This stringent requirement implicitly dictates a certain minimum farm size. If associates were allowed to undertake supplementary income-earning activities at an individual level, such as cultivating their own plot in addition to the group farm, or seeking part-time non-farm work, then even small farms could pool their resources and farm collectively, while also pursuing other earning opportunities. Of course, in such models, it would be especially important to set in place mechanisms for monitoring each associate's work contribution, in order to ensure that the work is equitably shared and the likelihood of free riding is minimised.

For India, on the one hand, the GAEC model points to a potential pathway for women farmers and junior family members to move away from simply being unpaid workers on family farms, since it allows spouses, siblings, and parents and adult children to become equal business partners in a group farm.

On the other hand, models such as those followed by India, that allow a combination of group farming and individual activity (rather than models which only allow group activity) are likely to be more relevant for developing countries, since most farmers cultivate very small farms of a hectare or less, and therefore need to diversify their livelihood portfolios to earn a decent income. Such models may also be of relevance for parts of France.

Overall, looking ahead, group farming can provide an important third pathway to farming, beyond family farms and corporate agriculture, not only for farmers who are seeking better economic and ecological outcomes, but also for newcomers interested in community-based options, agroecological practices, and building social and solidarity economies around food and farming systems.