



CHAPTER 1

**Who was Galaye Dia (1941-2013)?, by Profs Gane Samb
Lo and Aboubakary Diakhaby**

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Abstract. We briefly present to our readers the late Prof: Galaye Dia in the honour to whom this collection of mathematical texts is published: He mainly focus on this important role in the development of Mathematics in Africa, his carrier and his achievements both in teaching, research and dissertation supervision.

Keywords. Presentation; teaching; supervision; list of supervised dissertations; career; academic training; thesis

AMS 2010 Mathematics Subject Classification. 00B99

Cite the paper as :

G. S. Lo and A. Diakhaby (2018). Who was Galaye Dia (1941-2013)?.

In *A Collection of Papers in Mathematics and Related Sciences, a festschrift in honour of the late Galaye Dia* (Editors : Seydi H., Lo G.S. and Diakhaby A.). Spas Editions, Euclid Series Book, pp. 15 – 19

Doi : 10.16929/sbs/2018.100-00-02

©Spas Editions, Saint-Louis - Calgary 2018 H. Seydi *et al* (Eds.) A Collection of Papers in Mathematics and Related Sciences, a festschrift in honour of the late Galaye Dia. Doi : /10.16929/sbs/2018.100.

1. Introduction

It will be hard to come with a complete presentation of Professor Galaye Dia. At least, we may give an overview of what we know about his very fruitful university career, report a number of important facts we may relate to him. In summary he served in Cheikh Anta Diop University (UCAD), Dakar, from 1972 to 1990 and Gaston Berger University, Saint-Louis, beginning 1990. At his retirement, he was appointed *Honorary Professor*. He was the first to have that honor.

2. Scientific Career

Beginning of his research career.

Prof G. Dia earned his Msc degree in Mathematics from the university of Grenoble (France) in 1972 and returned home to be part of the Mathematics department of UCAD. He resigned from a position in a great bank of Dakar and preferred a scientific career. The research career of Prof G. Dia really began with his first doctorate in 1977 on the topic :

Convex and closed and bounded valued Integrals ,

under the supervision of Prof Sakhir Thiam, the pioneer of Applied Mathematics in Senegal. That first doctorate, called *Doctorat de troisième cycle*, was the entrance of the profession of university professor in the French speaking universities.

A second and more difficult thesis was necessary to become a senior professor. In average, it generally took around quite a few years (8 to 10 years) to get the *Doctorate d'Etat*. Pr G. Dia went to the prestigious Pierre and Marie University (Sorbonne) to prepare that thesis under Professor Jean Geffroy on the topic :

Order Statistics in Point Processes, estimation of the regression ,

in the Laboratory (LSTA) of Professor Paul Deheuvels. He defended that thesis on February 25, 1986.

At that time, in French Universities and those in French Speaking countries, the number of holders of *Doctorate d'Etat* was kept low since a *Doctorate d'Etat* was the key to seniority and to the opening of a doctoral school

at his name.

It was normal that Prof G. Dia, from that time, became a major actor in Mathematics in Senegal, alongside the first high level mathematician of West Africa, the dean, Prof Souleymane Niang, the founder of the Algebra school in Africa, Prof Hamet Seydi and the founder of the Senegalese Applied Mathematics School, Prof Saxir Thiam.

By the way, he was the only senior university professor in Probability and Statistics in West Africa. Right after his return to Dakar, he took the chair of the Mathematics department of Cheikh Anta Diop University and some years after, was asked to move to Saint-Louis to put on tracks the new faculty of Sciences in the newly launched Gaston Berger University at Saint-Louis. Since that time, he continuously took part in all programs in Mathematics as a major player. In particular, he was elected as a member of the National Academy of Sciences and Techniques (ANAST) of Senegal. We will come back to the important positions he held.

Research achievements.

Despite his numerous responsibilities, he continued to engage in research activities and published around 20 papers and working documents in a diverse set of international journals. A full list of his publications is given in Section 5.

We already know that Prof G. Dia began his career in Functional Analysis, particularly in Abstract Integration and moved to Statistics. He mainly worked on point processes, regression functions, ruin probability, non-parametric estimation. Lately, he focused on welfare analysis, in particular poverty analysis. He opened a very interesting and non-parametric method to estimating the poverty index, the Foster-Greer-Thorbecke index to be precise. That method is being studied, deepened and generalized by Prof Diakhaby and his team. Actually, in that book, the two papers which are co-authored by Prof Diakhaby derive from the method invented by Prof G. Dia.

Supervision.

He supervised Prof Diakhaby, co-editor of this book, mainly for the first doctorate. He also supervised a dozen of Master of Sciences Dissertations,

in particular the first of them in Probability and Statistics.

3. Professional career

Professor Galaye Dia had held the main positions in the Senegalese Universities, from Department chairman to dean of the Science faculty and vice-president of the university.

He was fully engaged in serving the development of Mathematics through the Association of Teachers of Mathematics and the Senegalese Mathematics Society.

In 2004, he has been elected to the National Academy of Sciences and Techniques, and served in it until he passed away.

In summary, Prof G. Dia tremendously took part in teaching all branches of Mathematics, supervised generations of young students. He founded a reputed faculty in Saint-Louis. More important, he founded a research school in Probability and Statistics which finally gave birth to one of the greatest teams in Africa. Placed in the context of his time, Prof G. Dia may be considered as one of the greatest Mathematicians in Africa.

4. Services to the Mathematical Community

Prof G.Dia was very engaged in the development of Mathematics at all levels. He was an active member of APAMS, the Senegalese branch of African Association of Mathematics teachers in Africa. He served in the board a very long time. He also strongly militated in the Senegalese Mathematics Society (SMS). He was part of the launching conference of the African Mathematical Union, Rabat, 1976.

He attended several international conferences, in particular, the International Congress of Mathematics held in Vancouver in 1974.

Being the first full professor in Probability and Statistics in the West African region, he was consulted in any question about that sub-discipline of Mathematics. He taught in several African universities, Chad (1978), Mauritania (1982) to cite a few, and in France.

In particular, he was a prominent member of the Specialized Technical Committee of Mathematics, Physics and Chemistry (MPC-CTS) of the Higher Education Council of Africa and Madagascar (CAMES). The CAMES gathers 16 countries and more than 90 universities. The MPC-CTS is the unique place where professors in African French speaking universities are qualified and ranked into assistant professors, associated professors and full professors in the three cited disciplines.

From 2004, he was elected as member of the National Academy of Sciences and Techniques where he continued to serve Sciences in general.

5. List of publications and supervision

List of publications.

- (1) Non-parametric estimation of income distribution and poverty index in the unidimensional context with $\alpha \in]0, 1[$. *C. R. Acad. Sci. Paris, Ser. I*, 353(10):947–952, 2015.
- (2) Estimation nonparamétrique de la distribution des revenus et de l'indice de pauvreté. *C. R. Acad. Sci. Paris, Ser. I* 346:907–912, 2008.
- (3) Bidimensional non-parametric estimation of well-being distribution and poverty index, 2014, *Afr. Stat.*, 9, pp 695–725.
- (4) Asymptotic normality of the kernel poverty measure estimate. *Journal of Mathematical Sciences: Advances and Applications*, 3(1):21–39, 2009.
- (5) Estimation of a Regression Function on a Point Process and its Application to Financial Ruin Risk Forecast, 2009, *Serdica Mathematical Journal Bulgarian Academy of Sciences*, 359-380, J.35.ote
- (6) Asymptotic Normality of the Kernel Poverty Measure Estimate, 2009, *Journal of Mathematical Sciences: Advances and Application*, 21-29, Volume : 3 (1)
- (7) Estimation Non paramétrique de la Distribution des Revenus et de l'Indice de la Pauvreté, Année 2008, *C.R. Acad. Sci. Paris*.
- (8) Répartition Aléatoires des Revenus et Estimation de l'Indice de Pauvreté, Année 2005, *Afrika Statistika*, 47-66, 1, (1).
- (9) Estimation of a Regression Model an its Application in Renewal Process. *Les Préprints du Laboratoire de Technique quantitative. Université Cheikh Anta Diop*, Volume : 03 (7).

- (10) Estimation non paramétrique de la densité de régression pour un processus ponctuel, 1995, C.R.Acad.Sc.Paris, 1627-1630, t.321.
- (11) Estimation de la densité et de la courbe de régression d'un processus ponctuel, 1991, Technical Report, LSTA Univ. Pierre et Marie Curie (Paris), 151.
- (12) Non parametric estimation of the density of a point process, 1990, Statist.Probab.Letters, 397-405.
- (13) Loi limite du régréssogramme pour un processus ponctuel, 1989, Serdica Bulgaricae Mathem, 203-209, Volume 15.
- (14) Evolution asymptotique de l'enveloppe convexe des points d'une superposition de processus de Poisson sur \mathbb{R} , 1986, Technical Report, LSTA Univ.Pierre et Marie Curie (France), 47-54, (61).
- (15) Estimation of regression function on a Poisson process, 1987, Statist. Probab. Letters, 47-54, Vol. 6, (1).
- (16) Blocs équilibrés d'une suite aléatoire de variables statistiques, 1987, Inst. Stat. Univ. Paris, 19-44, (32).
- (17) Estimation non paramétrique de la fonction de régression pour un processus ponctuel, 1986, LSTA Univ.Pierre et Marie Curie (France)
- (18) Etude d'un estimateur de la fonction de régression pour un processus ponctuel à valeur dans $\mathbb{R}^s \times \mathbb{R}(s;0)$, 1987, Serdica Bulgaricae. Mathem, 383-395, Volume : 13.
- (19) Etude des statistiques d'ordre d'une superposition de processus ponctuel, Année 1985, LSTA Univ Pierre et Marie Curie (France).

List of Supervisions.

Theses.

Aboubakary Diakhaby, Thèse de 3ème cycle, Estimation de la densité et de la regression dans les processus chromatiques, Dakar, 92.

Msc Dissertations.

- (1) Aboubakary Diakhaby, DEA, Estimation non-paramétrique de la densité de probabilité et du mode: Méthode du noyau, UCAD, 8919,
- (2) Aliou Diop, DEA, Processus ponctuels réguliers et applications, 1992.
- (3) Mme Diagana née Niouma Bathily, DEA, Estimation non-paramétrique de la fonction de répartition, UCAD, 1990,
- (4) Aly Souleymane Daby, DEA, Etude de l'estimateur de la fonction de regression pour un processus ponctuel à valeurs dans $\mathbb{R}^2 \times \mathbb{B}$, UGB, 1994,
- (5) Demba Bocar Ba, DEA, Estimation par la norme L2 du paramètre d'un processus d'Ostein-Uhlenbeck, UGB, 2000,
- (6) Saliou Diouf, DEA, Contribution à l'étude des plages d'appui d'un échantillon aléatoire dans le plan, UGB, 2001,
- (7) Amedoune Ould ABDI, DEA, Classement en termes d'inégalité des distributions de revenus, UGB, 2005,
- (8) Moise Basse, DEA, Intersecting Generalised Lorentz Curves and The Gini Index, UGB, 2005,
- (9) Salimata Diop, DEA, Measurement of Inequality, UGB, 2006,
- (10) Yoro Dème EME, DEA, Croissance économique et pauvreté au Sénégal: Analyse paramétrique des distributions de dépenses de consommation des ménages, UGB, 2006.

DEA : corresponds to the Master dissertation in the French system of at that.

Conclusion

There is no doubt that Prof G. Dia is the pioneer in the Probability and Statistics research and teaching in the Senegalese and West African Universities. He helped a lot to boost the development of that discipline through the Laboratory of Probability and Statistics he co-launched with Prof Gane Samb Lo in 1991. In general, he significantly impacted the development of Mathematics in Senegal, after the first Big Three: Professors Souleymane Niang, Hamet Seydi and Sakhir Thiam .

May he rest in Peace in Saint-Louis.