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### TOWARD A GREEN REVOLUTION AT SCALE IN AFRICA REACHING THE POTENTIAL NORMAN BORLAUG FOUGHT FOR TO REALIZE



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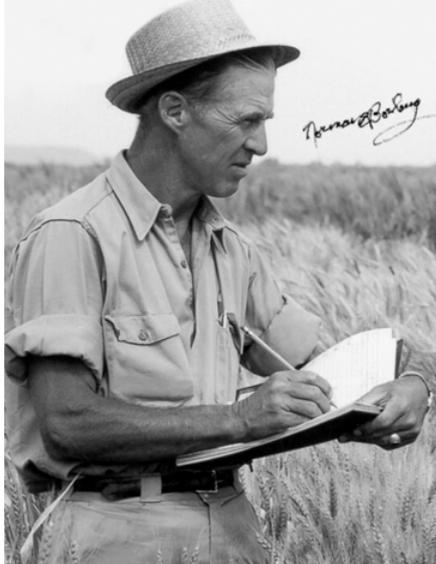
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Uma Lele is to be thanked for having hinted at one of the central arguments of the following pages, and for the insights she shared. Cf. in particular, Lele, Uma and Goldsmith, Arthur A. "The Development of National Agricultural Research Capacity: India's Experience with the Rockefeller Foundation and Its Significance for Africa", *Economic Development and Cultural Change*, Vol. 37, No. 2 (Jan., 1989), pp. 305-343.

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## CELEBRATING A MAN



A few weeks ago, at Ciudad Obregon, in the Northern plain of Mexico, in the middle of hundreds of small wheat experimental plots, some 600 agricultural scientists gathered to mark the birth, in Cresco, Iowa, March 25, 1914, of a man whose entire life was passionately dedicated to transforming agriculture for the benefit of Mankind, including, since 1985, in Sub-Saharan Africa. Norman Borlaug was not an ordinary man. <sup>2</sup>His significant contribution to what former United States Agency for International Development (USAID) director William Gaud called in 1968 the “Green Revolution”,<sup>3</sup> won him, in 1970, the Nobel Peace Prize, awarded for having “helped to provide bread for a hungry world”. <sup>4</sup>

How such a contribution took form? In her noteworthy Nobel Prize presentation speech, Aase Lionaes, Chairman of the Nobel Committee, told it all and well. Indeed Norman Borlaug was a scientist, but

*“behind the outstanding results in the sphere of wheat research of which the dry statistics speak, we sense the presence of a dynamic, indomitable, and refreshingly unconventional research scientist.*

*Dr. Borlaug is not only a man of ideals but essentially a man of action. Reading his publications on the green revolution, one realizes that he is fighting not only weeds and rust fungus but just as much the deadly procrastination of the bureaucrats and the red tape that thwart quick action.”* <sup>5</sup>

<sup>2</sup>For an overview of Norman Borlaug’s life and engagement, see Hesser, Leon, *The Man Who Fed the World: Nobel Peace Prize Laureate Norman Borlaug and His Battle to End World Hunger*, Durban House Publishing, Dallas, 2006. As well as *Norman Borlaug on World Hunger*, Edited by Anwar Dil, Bookservice International, San Diego/Islamabad/Lahore, 1997, 499 pages.

<sup>3</sup>“These and other developments in the field of agriculture contain the makings of a new revolution. It is not a violent Red Revolution like that of the Soviets, nor is it a White Revolution like that of the Shah of Iran. I call it the Green Revolution.” ([http://en.wikipedia.org/wiki/Green\\_Revolution](http://en.wikipedia.org/wiki/Green_Revolution)).

<sup>4</sup>“Presentation Speech by Mrs. Aase Lionaes, Chairman of the Nobel Committee”, *Les Prix Nobel en 1970*, Editor Wilhelm Odelberg, Nobel Foundation, Stockholm, 1971. ([http://www.nobelprize.org/nobel\\_prizes/peace/laureates/1970/press.html](http://www.nobelprize.org/nobel_prizes/peace/laureates/1970/press.html))

<sup>5</sup>*Ibid.*

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In short, Norman Borlaug was a plant breeder. He was a scientist and an innovator, eager to experiment. But what describes him best is his character, his humanity, his incredible dedication and stubbornness. He was opinionated, impatient, in many ways politically incorrect, not much inclined to listen to whoever was critical of what he thought and did. He battled for his idea in the fields with and for smallholder farmers, with the aim of achieving what he was convinced was the right thing to do, aiming not only at improving “agronomic methods, ... the use of artificial fertilizers, improved soil culture, and mechanization”, but more so at breaking out “of the vicious circle of poverty”,<sup>6</sup> through giving farmers the tools to increase productivity and production. He was a great communicator, not for the sake of communicating, but to mobilize around a cause, banging on doors whenever needed, never giving up. He had also what often distinguishes achievers. He kept what he advocated simple and straightforward, as much as possible rooted in common sense. He did not need, and was most reluctant to back decisions and moves by studies and reports, by evaluations, or by log frames, which to him were illustrations of the procrastination he was after, and signs of the fear to fail and lack of courage, more than instruments to professionalize economic development.

### **BRINGING THE GREEN REVOLUTION TO AFRICA**

The Green Revolution was initially launched and won in Asia,<sup>7</sup> in Pakistan and India first, not to forget Mexico where it all began. It finally reached the shore of the African continent,<sup>8</sup> in part thanks to a visionary man, stubborn too, Ryoichi Sasakawa,<sup>9</sup> who in 1984 persuaded Norman Borlaug to join force with President Jimmy Carter and him, to bring the Green Revolution to Africa, based on the model which had been successful in South Asia and elsewhere.

Not enough is known today about what Norman Borlaug – who was then 70 years old - dedicated the rest of his life to Norman Borlaug was not too much interested in

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<sup>6</sup>*Ibid.*

<sup>7</sup>See Borlaug, Norman, “The Green Revolution, Peace, and Humanity, Nobel Lecture, December 11, 1970”, *Les Prix Nobel en 1970*, Editor Wilhelm Odelberg, Nobel Foundation, Stockholm, 1971. As well as Borlaug, Norman E, *The Green Revolution Revisited and the Road Ahead*, Special 30th Anniversary Lecture, The Norwegian Nobel Institute, Oslo, September 8, 2000 ([http://www.nobelprize.org/nobel\\_prizes/peace/laureates/1970/borlaug-article.html](http://www.nobelprize.org/nobel_prizes/peace/laureates/1970/borlaug-article.html))

As an example of the very abundant literature on the Green Revolution in Asia, see also Hazell, Peter B.R, *The Asian Green Revolution*, International Food Policy Research Institute (IFPRI), Washington, 2009, (IFPRI Discussion Paper).

<sup>8</sup>This is not to say that until then agriculture development was neglected in Sub-Saharan Africa, and that there were no other projects addressing the transformation of agriculture.

<sup>9</sup>Chairman of the Japan Shipbuilding Industry Foundation (JSIF). Ryoichi Sasakawa commitment to a Green Revolution in Africa and to Norman Borlaug ideas and legacy has been often renewed and

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documenting, data collection or writing about what he was involved in. It is alleged that he used to say: "What would you rather have - bread or paper?"<sup>10</sup> He was also not so much interested in agro-economics, and thus not in figures. Plants and fields were his kingdom.

Therefore, anyone attempting to figure out what Norman Borlaug -and all who worked with him and who he trusted and empowered – achieved, soon realizes how far he is likely to be from what the reality was, how little one yet knows and how much one has to guess on the basis of hypotheses. Indeed this is a good case when humility should be the historian's first quality, when telling the past and looking for keys to understand what happens, why it did happen, results achieved and consequences to be drawn upon.<sup>11</sup>

In a nutshell, what can be told of the outcome of a period of over 25 years? Thanks to the leadership of Norman Borlaug, and not to be forgotten, of President

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reinforced by Yohei Sasakawa, Chairman of the Nippon Foundation, which is still the main source of funding for the institutions which Norman Borlaug did chair, SAA and SAFE.

<sup>10</sup>"Presentation Speech by Mrs. AaseLionaes.

<sup>11</sup> Among articles, papers and other contributions providing good insights into the history of SG 2000:

Quinones, Marco A., Borlaug, Norman E. and. Dowswell, Christopher R A, "Fertilizer-Based Green Revolution for Africa", *Replenishing Soil Fertility In Africa*, Soil Science Society of America, Madison, 1997, (SSSA Special Publication Number 51).

Nubukpo, Kako and Galiba, Marcel, *Agricultural Intensification in West Africa: Insights From Sasakawa Global 2000's Experience*, paper presented at the Workshop on agricultural transformation, sponsored by Tegemeo Institute / Egerton University, Njoro, Kenya; Eastern and Central Africa Programme for Agricultural Policy Analysis (ECAPAPA), Entebbe, Uganda; Michigan State University, East Lansing, Michigan, USA and United States Agency For International Development, Nairobi, Kenya, June 27-30, 1999, 24 p.

Howard, Julie; Crawford, Eric; Kelly, Valerie; Demeke, Mulat; Jeje, José Jaime, "Promoting high-input maize technologies in Africa: the Sasakawa-Global 2000 experience in Ethiopia and Mozambique", *Food Policy*, 28, 2003, pp 335–348.

In general, the Proceedings of the Workshops organized in cooperation with SG 2000, between 1985 and 2002, by the Centre for Applied Studies in International Negotiations (CASIN) contain several studies on the activities and programs of SG 2000. Those proceedings were edited by one of Norman Borlaug's closest associates, Christopher R.A. Dowswell.

The website of the Sasakawa Africa Association provides detailed information on the work of the organization including on programs in countries where its activities have been concluded (example on Ghana: <http://www.saa-safe.org/www/ghana.html>)

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Carter, <sup>12</sup>millions of smallholder farmers in some 15 Sub-Saharan countries <sup>13</sup>were exposed to agronomic approaches allowing them to increase productivity and production. The methodology was simple. With the backing of Heads of State, in close cooperation with Ministries of agriculture, the organization jointly created by Norman Borlaug and President Carter, SG2000, <sup>14</sup>with a limited staff, generously funded by the Nippon Foundation, “developed program activities with—and through—national research and extension organizations”.<sup>15</sup>Those program activities were essentially “dynamic field testing and demonstration programs for the major food crops in which improved technology existed but for various reasons were not being adequately extended to farmers”.<sup>16</sup> In short what international agricultural research centers <sup>17</sup>had developed for years if not decades, what national research centers had tested locally in the countries’ particular ecology, was brought to the smallholder farmers, through hundreds of extension workers. Wherever farmers were demonstrated an improved technology, they could see the difference in productivity and increased production. On average, in maize, yield levels increased to 4.0-5.0 t ha<sup>-1</sup>, in short tripled. But other improved technological packages for other crops were proposed to farmers, with equally significant results. Attention was also paid to the nutritive value of the crop proposed with the introduction of quality protein maize (QPM). In each country, only a few hundreds of smallholder farmers were initially involved, but soon there were thousands and tens of thousands who joined. Part of the seeds of a Green Revolution in Africa were thus sown.

Nowhere in Africa yet, however, can one say that the Green Revolution did happen as it did in India, or Pakistan, and at the speed it took place. <sup>18</sup>Outcomes of what has been

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<sup>12</sup>Norman Borlaug was indeed the operational president of SAA. But in many ways, what was achieved was the result of the unique and remarkable cooperation and complementarity of three personalities, Norman Borlaug, President Jimmy Carter, and Ryoichi Sasakawa, not to forget Yohei Sasakawa. This explains in part why SG 2000 was so special and could implement a distinctive manner of addressing the agricultural development challenge.

<sup>13</sup>Ghana, Sudan, Zambia, Tanzania, Benin, Togo, Mozambique, Eritrea, Guinea, Burkina Faso, Malawi, and still in operation in 2014, Ethiopia, Mali, Nigeria and Uganda.

<sup>14</sup>SG 2000 is a joint venture between the Sasakawa Africa Association (SAA), an organization legally established in 1986, in Geneva, Switzerland and the Carter Center's Global 2000 Agriculture Program, in Atlanta, Georgia, to which Norman Borlaug was a senior consultant.

<sup>15</sup>Quinones, Marco A., Borlaug, Norman E. and. Dowswell, Christopher R A, “Fertilizer-Based Green Revolution for Africa”.

<sup>16</sup>*ibid.*

<sup>17</sup> In particular, the International Maize and Wheat Improvement Center (CIMMYT), the International Institute of Tropical Agriculture (IITA), the International Crops Research Institute for the Semi-Arid-Tropics (ICRISAT), the International Rice Research Institute (IRRI).

<sup>18</sup> “A mere three years after being introduced, in 1968/1969 the semi dwarf Mexican wheat varieties, covered nearly 30% of India’s wheat land, 38% of Pakistan’s, and 25% of Nepal’s. Five years later they

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so far a very significant effort have been usually impressive, but unequal. The African continent is a fragmented one, and in part its development has to be addressed country by country. Norman Borlaug, through SG 2000, covered some 15 countries, possibly too many, for an organization which stayed small and had limited means. Farmers were quick to learn how to apply demonstrated technological packages. The challenge was then to ensure adoption, in other words sustainability. It differed from country to country, often depending on the commitment of the State, and also on what happened beyond the farm's gate, including market access. Increased production meant surplus food to be sold on markets. Ten of thousands of farmers suddenly producing more food resulted in large quantities to be stored, if possible transformed, transported, and sold. This is what agricultural development is all about when it is successful on the farm. New challenges emerge of an economic and logistical nature. Agricultural development is in front of a quantum jump. SG 2000 was not thought of to jump.

It is also important to underline that the context in 1986 was a very different one, compared to the one which existed 20 years before, with very limited attention paid to agriculture, and thus limited funding for agriculture, at international and national level. Furthermore, at a certain stage, the World Bank, eager to reduce the weight of the State, and the State apparatus, recommended to cut into one of the main instruments a ministry of agriculture has to “take it to the farmers”, its cohort of extension agents, so central in rural development, and which the Bank recommended to privatize.

Norman Borlaug thus did not see his dream fully realized. Too many farmers still do “eat potential”, and do not benefit from the promises of better harvests which would lift them out of poverty.

### **THE GREEN REVOLUTION, A COLLECTIVE ENDEAVOR, AND THE CENTRAL ROLE OF THE STATE**

Whatever catalyzing role a single individual like Norman Borlaug might have played, the Green Revolution is primarily the result of a collective endeavor. This is often forgotten when a prize undeniably well-deserved single out a personality. Norman Borlaug knew and acknowledged the collective nature of what he was honored for. In receiving the Nobel Peace Prize, he paid a tribute to the “army of hunger fighters in which I voluntarily enlisted”.<sup>19</sup> If he had been specific, he would have referred to the

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covered almost 60% in India and Pakistan and had continued spreading elsewhere”. Quoted from Herdt, Robert W., “People, institutions, and technology: A personal view of the role of foundations in international agricultural research and development 1960–2010”, *Food Policy*, 37 (2012), p. 181.

<sup>19</sup> “Norman Borlaug's Acceptance Speech, on the occasion of the award of the Nobel Peace Prize in Oslo, December 10, 1970”. *Les Prix Nobel en 1970*, Editor Wilhelm Odelberg, Nobel Foundation, Stockholm, 1971. ([http://www.nobelprize.org/nobel\\_prizes/peace/laureates/1970/borlaug-acceptance.html](http://www.nobelprize.org/nobel_prizes/peace/laureates/1970/borlaug-acceptance.html))

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very many national and international institutions, and ultimately to the States and the Governments' leaders, who, sharing a vision, agreeing on the strategic objectives and the strategy, took bold decisions, engaged the State apparatus and made it happen.

Just to take a few examples. In Pakistan, the personal support of the President of Pakistan, Ayub Khan, was central. In India, no Green Revolution would ever have been achieved without the commitment and decisions of its Prime Minister, Indira Gandhi, and of its Minister of food and agriculture, Shri C. Subramanian. This is not to minimize the role of other single individuals and of many non-state national and international actors. All play a role. All contribute. They add pieces to a complex puzzle, but only pieces, whatever the importance of those pieces may have in achieving a revolution such as the Green Revolution. In particular they put in place the preconditions for such a revolution. They demonstrate through projects the value of an approach. But when it comes to achieving the revolution in a meaningful way, at a macro level, only the State has the means and the capacity to create the concrete conditions to do so, as only the State can operate at the required scale.

Within the development industry, one regularly talks about scaling up successful projects. However most projects stay what they are, often successful, but small. This is very much due to the fact that scaling up requires operating at a scale which only a State is capable of, with some rare exceptions of very few, very large companies. This does not mean that the State might alone face successfully challenges of a great magnitude, and that it should not partner with other stakeholders, public and private, national and international, but that it should take the lead.

Some figures should serve as illustrations. In India, as a prerequisite to the Green Revolution, the appropriate kind of seeds were indispensable in the required quantity and at the right time. Thus the Minister of food and agriculture ordered 18 thousand tons of Lerma Rojo 64 semi-dwarf seed variety. Only he could take such a decision, a bold one as he did face opposition.

Another figure related to another major achievement of Mankind, also in India, at the same period as the Green Revolution, in the sixties, tells equally well the central and unique role of the State. The eradication of smallpox in India, which was central to the eradication of smallpox worldwide,<sup>20</sup> and where a man, William Foege, can be said to

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<sup>20</sup>On the eradication of smallpox, see Foege, William H., *House on Fire. The Fight to Eradicate Smallpox*, University of California Press, 2011 (California/Milbank Books on Health and the Public). As well as Henderson, Donald Ainslie, "Smallpox Eradication", *Public Health Report*, September-October 1980, Vol.95, no 5, pp.422-426. Subsequently Donald Ainslie Henderson wrote a much longer analysis, *Smallpox - The Death of a Disease: The Inside Story of Eradicating a Worldwide Killer*, New York, Prometheus Book, 2009. See also. The very well documented, and important for its set of lessons learned, Fenner, Frank; Henderson, Donald Ainslie; Arita, Isao; Ježek, Zdeněk; Ladnyi, Ivan Danilovich, *Smallpox and its Eradication*, Geneva, World Health Organization, 1988.

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have also played a major catalyzer role, like Norman Borlaug, - would never been achieved without the engagement of the State.

In India, when the smallpox eradication program was launched, as recalled by William Foege, “an incredible army of people, approaching thirty-five thousand in number, (was) assembled for smallpox alone. ... within a couple of years, this would be only the core of a much larger army concentrating on smallpox”.<sup>21</sup> People were first needed for surveillance, for searching for cases of smallpox. As an example of the magnitude of the size of human resources needed, in the context of one of the searches in Uttar Pradesh, “health workers seeking smallpox (managed) to get into almost 99% percent of the State’s 140’000 villages and do at least a cursory search of smallpox in the short span of six days”.<sup>22</sup>

In short, when it comes to achieving a revolution such as the Green Revolution, meaning a revolution at scale in an entire country or in very significant part of it, the massive involvement of the State is indispensable, just because of the size of the endeavor, to start with. It is to ensure the involvement of the State, to trigger a process that the catalyst role of personalities such as Norman Borlaug and William Foege – and the organizations active behind them - is a prerequisite.

In Africa, although President Carter and Norman Borlaug did visit and convinced many Heads of State, and were able to ensure the close cooperation of ministries of agriculture, things did not prove as “simple” as in India and Pakistan. Personalities and circumstances matter.

The closest to a Green Revolution on the African soil one seems to be able to speak of is the case of Ethiopia. This is possibly one of the best examples of a transformation of national agriculture on the continent. It was engaged at scale under the leadership of a committed Prime Minister, Meles Zenawi. The story recalled by one of Norman Borlaug’s closest teammates and who was instrumental in Ethiopia, Marco Quinones - of how it partly began is worth telling:

*“The Ethiopian experience has resulted from a combination of a political leader's vision and a fortuitous encounter with the field activities of SG 2000, operating in Ethiopia since 1993. During a visit of former U.S. President Jimmy Carter in September 1994, an invitation was made to Prime Minister Meles (then President of the Transitional Government) to accompany Mr. Carter on a field inspection tour of some project sites. Mr. Meles was clearly impressed by the demonstration plots grown by the*

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<sup>21</sup>Foege, *House on Fire*, p. 103.

<sup>22</sup>Foege, *House on Fire*, p. 115.

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*farmers, in which improved seed and mineral fertilizers were used in combination with other improved husbandry practices. The plots promised to yield three to four times the average yields obtained in the area. That watershed visit was the beginning of what is now known in Ethiopia as the Intensified Extension Campaign, which is fully backed and supported by the government at all levels.”<sup>23</sup>*

The tour referred to by Marco Quinones contributed much to Meles Zenawi engaging in the transformation of Ethiopian agriculture along the lines of what SG 2000 was engaged in and demonstrating<sup>24</sup>, and in the manner he thought he should, deliberately, often against the advices of some major international actors. He acted fast. He understood well the central importance of extension workers, and massively recruited and trained State extension agents, at the time the World Bank was recommending privatizing the extension systems. Norman Borlaug himself was struck by the boldness of the Prime Minister of Ethiopia. When told in 1995, at a time when some 40'000 farmers were involved in the SG 2000 demonstration schemes, that Ethiopia was shooting for 10 times more a year after, Norman Borlaug got concern at the rhythm proposed and said so to a Prime Minister he could not convince and who two years later could proudly write to President Carter that Ethiopia had exported maize. Ethiopia had transformed its agriculture at scale.

The case of Ethiopia is probably unique on the African continent, as the State almost completely dominates the agricultural process of change. Unique probably also is the staunchness of Meles Zenawi. It is now to its successors to ensure the sustainability of what he initiated.

Other countries where Norman Borlaug and SG 2000 were involved, offer more nuanced pictures, to the extent that it cannot be said that the transformation of agriculture seems to have been elsewhere initiated and led at scale.

A good case is Ghana, which also successfully transformed its agriculture. Here again, the State was the central partner to SG 2000 when it initiated its operations in 1986. Here again, the dedication and involvement of the Head of State, Chairman of the Provisional National Defense Council (PNDC), Jerry John Rawlings, and of the

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<sup>23</sup>Quinones, Marco A., Borlaug, Norman E. and. Dowswell, Christopher R A, “Fertilizer-Based Green Revolution for Africa”.

<sup>24</sup>Takele Gebre, “Maize Technology Adoption in Ethiopia: Experiences from the Sasakawa-Global 2000 Agriculture Program, Enhancing the Contribution of Maize to Food Security in Ethiopia”, *Proceedings of the Second National Maize Workshop of Ethiopia*, 12-16 November 2001, Edited by: Mandefro Nigussie, D. Tanner, and S. Twumasi-Afriyie, Ethiopian Agricultural Research Organization (EARO) & International Maize and Wheat Improvement Center (CIMMYT), Addis Ababa, Ethiopia, pp 153-157.

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Secretary of agriculture, Commodore Steve Obimpeh, was determinant.<sup>25</sup> But the process through which the transformation occurred was a slower one, perhaps less deliberate, and more rooted, when compared to Ethiopia.

The case of Mali is again different. SG 2000 was active and successful in Mali, with projects which however essentially seems to have been not enough thought of as stepping stones to an “at scale” process. Mali’s Heads of State, but particularly, President Amadou Toumani Touré,<sup>26</sup> and one of his closest associates, Prime Minister Modibo Sidibé, were both very supportive of SG 2000, and more so actively engaged in the agricultural transformation of Mali. The *Loid’ Orientation Agricole (LOA)*<sup>27</sup> voted in 2006 illustrates well the commitment of President Touré to the development of agriculture in his country as well as the decision to fulfill the July 2003 *Maputo Declaration on Agriculture and Food Security in Africa* to allocating at least 10% of national budgetary resources for the implementation within five years of sound policies for agricultural and rural development. The Rice initiative is a testimony of the same commitment.<sup>28</sup> They all were steps towards operating at scale, but with further moves still needed.

The most intriguing case is the one of Nigeria, indeed a most potent State, but where the role of the Federal State in agriculture was until recently almost nil, to the extent that a President as dedicated to agriculture as President Olusegun Obasanjo could acknowledge how powerless a president was when attempting to address the

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<sup>25</sup>Martinez, Eugenio; Akposoe, M.K.; Galiba, Marcel and Hong, C.W., “The Sasakawa-Global 2000 Agricultural Project in Ghana.” *Feeding the Future: Agricultural Development Strategies for Africa*, edited by C. Dowswell, CASIN/SAA/GLOBAL2000, Mexico D.F., 1989, pp. 31-55 (Proceedings of the CASIN / SAA / Global 2000 Workshop).

Yudelman Montague; Coulter, John; Goffin, Paul; Mc Cune, D.; and Ocloo, Esther, “An Evaluation of the SG 2000 Project in Ghana,” *Africa’s Agricultural Development in the 1990s: Can It Be Sustained?*, edited by N. Russell and C. Dowswell, CASIN/SAA/GLOBAL2000, Mexico D.F., 1991, pp.45-55 (Proceedings of a workshop - Arusha, Tanzania, 14-18 May 1991).

See also on Ghana, and recently published, Joseph Kwarteng & Ida Kwarteng (Eds.), *Setting the Grassroots on Fire, Agriculture and Sasakawa Global 2000 in Ghana*, Zophai Publisher, Cape Coast, 2012.

<sup>26</sup>*Cf. Forging the Road Ahead for African Agriculture*, Report of the meeting held in Crans-Montana, Switzerland, August 28<sup>th</sup> – September 2<sup>nd</sup>, 1994, chaired by Olusegun Obasanjo and Amadou Toumani Touré, Canadian International Development Agency (ACDI) and Centre for Applied Studies in International Negotiations (CASIN), Geneva, 1994. This meeting was instrumental in developing the interest of, and the commitment to agriculture of Amadou Toumani Touré.

<sup>27</sup> On the LOA and to have access to the text of the law, <http://www.pca-mali.org/site/index.php/29-mediathèque/31-la-loi-d-orientation-agricole-du-mali-loa>

<sup>28</sup>*Cf. Plan d’opération de l’Initiative Riz, Campagne 2008-2009*, Cabinet du Premier Ministre, Bamako, avril 2008.

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development of agriculture in his country. This is now changing with the appointment of a powerful and experienced federal Minister of agriculture and rural development, Akinwumi Adesina, and the realization of a bold agricultural transformation agenda,<sup>29</sup> which includes the constitution of a federal extension system. The prerequisites for a Green Revolution at scale in Nigeria are thus being put in place.

To single out the vital role of the State communicates only one part of the story, in particular as in all countries in Africa that role seems to have been different. The case of India illustrates well how equally important was the engagement of major international actors, in particular the Rockefeller and the Ford Foundations, as well as USAID and the World Bank. The same is true when one observes the process of eradication of smallpox, to which the contribution of the World Health Organization (WHO) as well as of the Centers for Disease Control and Prevention (CDC) was essential.

No Green Revolution would have probably taken place in India, and so fast, if since the early 1950s, the major building blocks to the success of the Revolution had not been put in place as well described by Uma Lele, who examined in detail “the Rockefeller Foundation's role in transferring information about research techniques and organization to India in the 1950s and 1960s”, but also refers to the “important contributions to this process—for instance, of the U.S. Agency for International Development (USAID) in establishing agricultural universities, and the Ford Foundation and the Agricultural Development Council in supplying training”.<sup>30</sup> Institutions to which one should add the World Bank which played a critical role working with the private foundations and USAID in a pragmatic non-ideological way with consistent support.<sup>31</sup>

This tells well how much the Green Revolution seen in its entirety is a process, a long and a complex one, when taking into account all what is needed to make it happen. The rapidity at which the Green Revolution, looked at in a narrow perceptive, occurred in India, tends to hide the imperative to have a range of preconditions in place. As all revolutions, the Green Revolution had deep roots of all kinds.

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<sup>29</sup>*Agricultural Transformation Agenda: We Will Grow Nigeria's Agricultural Sector*, Federal Ministry of Agriculture and Rural Development, Abuja, Nigeria, September 2011.

<sup>30</sup>*Cf.* Lele, Uma and Goldsmith, Arthur A. “The Development of National Agricultural Research Capacity: India's Experience with the Rockefeller Foundation and Its Significance for Africa”.

Herdt, Robert W., “People, institutions, and technology: A personal view of the role of foundations in international agricultural research and development 1960–2010”, *Food Policy*, 37 (2012), pp. 179–190.

<sup>31</sup>*Cf.* Lele, Uma and Bumb, Balu, *Evolving Role of the World Bank - South Asia's Food Crisis: The Case of India*, The World Bank, Washington, 1994 and comment by Uma Lele.

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This tends to be often forgotten, in particular as impatience dominates, rightly so when one aims at eliminating hunger and alleviating poverty, in a period of demographic explosion, hunger and malnutrition.

### **BUILDING ON A LEGACY**

Life is about continuity and changes, about learning from the past to build better and certainly different futures. Lessons learned and the legacy received are and should be primarily sources of inspirations allowing to navigate, decide and act in a changing world, and probably a more challenging and complex one than the one Norman Borlaug lived in. What have we to learn?

Despite the different nature of the world we are in, some fundamentals are still valid and vital, e.g.

Agriculture and rural development are and will remain cornerstones of all societies,<sup>32</sup> be they developing or developed. Rural communities are and will stay major constitutive components of the very large majority of the countries of the world, with the exception of city's countries. Thus the central importance of their economic viability, crucial to the social, demographic and migratory, cultural and political stability, and therefore to security. Furthermore, economic viability of the countryside is also essential to prosperity, not forgetting their primary function to feed.

Green Revolutions are not only about providing more food, but much more so about the well-being of hundreds of millions of people, about their empowerments and their

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<sup>32</sup>In this connection, worth reading again the observation made by Charles Maurice de Talleyrand as he was visiting the United States in the early 1790s:

*“C'est par l'agriculture que tous les États doivent commencer. C'est elle, et je le dis ici avec tous les économistes, qui fait le premier fond de l'état social, qui enseigne le respect pour la propriété, et qui nous avertit que notre intérêt est toujours aveugle quand il contrarie trop l'intérêt des autres; c'est elle, qui, de la manière la plus immédiate, nous fait connaître les rapports indispensables qui existent entre les devoirs et les droits de l'homme; c'est elle, qui, en attachant les laboureurs à leur champ, attache l'homme à son pays; c'est elle, qui, dès ses premiers essais, fait sentir le besoin de la division du travail, source de tous les phénomènes de la prospérité publique et privée; c'est elle, qui entre assez dans le cœur et dans l'intérêt de l'homme pour lui faire appeler une nombreuse famille sa richesse; c'est elle aussi, qui, par la résignation qu'elle enseigne, soumet notre intelligence à cet ordre suprême et universel qui gouverne le monde; et de tout cela, je conclus que c'est elle seule, qui sait finir les révolutions, parce qu'elle seule emploie utilement toutes les forces de l'homme, le calme sans le désintéresser, lui enseigne le respect pour l'expérience au moyen de laquelle il surveille les nouveaux essais; puis, parce qu'elle offre toujours aux yeux les grands résultats de la simple régularité du travail; enfin, parce qu'elle ne hâte et ne retarde rien.”*

De Talleyrand, Charles Maurice, *Mémoires du Prince de Talleyrand*, Calmann Lévy, Paris, 1891,p. 236.

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dignity. This is why Green Revolutions should be a priority for States, in particular to those where subsistence farmers and farmers living in misery are still predominant.

Green Revolutions necessitate to come about at scale, the full and decided involvement, and leadership of the State. And no revolution is likely to take place if it is not at scale.

But as well summarized in the Report of a meeting held in 1994 under the chairmanship of Olusegun Obasanjo and Amadou Toumani Touré:

*“The state, in Africa, is often overwhelmed by responsibilities and tasks of all kinds. It is requested to provide general guidelines and regulatory frameworks, and simultaneously render concrete services to the agro-business community. Public administration is often overburdened with activities, many of which it is not structured and organized to perform. It does so at great costs, with insufficient return on investment, frequently inappropriate procedures, little transparency, and in an excessive centralized and bureaucratic way. The result is that it cannot concentrate on priorities and concurrently does not respond in an efficient manner to the needs of both farmers and entrepreneurs. One of the roles of the state is to allow civil society to do what it does best, and where state intervention is needed, to do so without diminishing the power of civil society.”<sup>33</sup>*

In other words, if the State has to take the responsibility of implementing at scale a Green Revolution, it has to be reengineered, and the role of the other stakeholders and partners in transforming agriculture well defined<sup>34</sup> in a manner which balances roles appropriately. Not an easy task as one has to avoid an excessive intrusion of the State so to let other actors and the market do their job, and simultaneously ensure that what is and should be a collective endeavor stays consistent, coherent and sustainable, in line with an overall vision, the decided strategic objectives and strategy.

Is there a need to underline that only governments can provide the overall requested enabling predictable, consistent and adaptable policy environment to scale up an agricultural revolution? In India, for example, the Intensive Agricultural Development Program (IADP) was already in place upon which to building new Green Revolution innovations in technology delivery and services.<sup>35</sup> Only governments can mobilize entire populations around agriculture drawing the attention of everyone on its

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<sup>33</sup>*Forging the Road Ahead for African Agriculture*, Report of the meeting held in Crans-Montana, Switzerland, August 28<sup>th</sup> – September 2<sup>nd</sup>, 1994, p. 9.

<sup>34</sup>Uma Lele is to be thanked for some of the following and relevant thoughts.

<sup>35</sup>Comment by Uma Lele.

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significance and the imperative to invest. Only government can engage in the massive logistical operations which a national transformation of agriculture entails.

In this connection, one can only point at the secondary, although important contributions, donors and external supporter do make. But they are no substitute for governments. Furthermore, they can also help destroy institutions and interventions they helped establish without replacing them with new functioning ones. In Africa, the entire integrated rural development approach put in place by the donors in the 1970s was rejected wholesale in the 1980s, even though it had helped build African institutions like the IADP in India; and although top down and fraught with many weaknesses which needed to be corrected like with the Green Revolution in India.<sup>36</sup>

Green Revolutions are much more than what, very naturally, has been in the limelight in countries such as India and Pakistan. It is quite understandable that what was spectacular should draw the attention the way it did. But what is not the tip of the iceberg which was highlighted?

Green Revolutions occur as the outcomes of long and complex processes, including institutions building, taking place over many years, and often decades. They do necessitate to materialize proper research establishments delivering appropriate and tested technologies to be eventually transferred to smallholder farmers. Strong extension systems,<sup>37</sup> - that was paramount to Norman Borlaug - are called for which will act as the go between research and the farms. Education and training, at all level

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<sup>36</sup>Comment by Uma Lele. Cf. Lele, Uma (Editor), *Aid to African Agriculture: Lessons from Two Decades of Donors' Experience*, The Johns Hopkins University Press, Baltimore, 1992. (<http://documents.worldbank.org/curated/en/1992/04/440161/aid-african-agriculture-lessons-two-decades-donors-experience>)

<sup>37</sup>About extension:

*"The good technologies, in order to be considered by the farmers for possible adoption, must first travel the distance between relevant research institutes and the farmers' fields. Then, they should be introduced to the farmers in non-technical language and the advantages of the technology over traditional practices must be demonstrated in a convincing manner, such as through field demonstration. Next, the necessary ingredients for trying the new technology, such as cost and any risk factors will have to be explained. Later, various adult education methods and participatory decision-making approaches need to be followed in order to encourage discussion on the information provided on the new technology in order to assess both positive and negative issues. Assuming that some progressive farmers are willing to try the new technology, arrangements will have to be made for other farmers to benefit from this limited "sample adoption" opportunity. The regular monitoring of the trial of the technology, including discussion with the progressive farmers, will be required for any trouble-shooting and eventually to assess the overall performance of the new technology under in situ field conditions. "*

Qamar, M. Kalim, *Modernizing National Agricultural Extension Systems: A Practical Guide for Policy-Makers of Developing Countries*, FAO, Rome, 2005, p. 2.

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are also imperative. This was a priority to Norman Borlaug who in the early 1990s proposed and launched the Sasakawa Africa Fund for Extension Education (SAFE).<sup>38</sup>

In other words, as Uma Lele<sup>39</sup> writes, one ought to have “a stable environment for agricultural research on a long term sustained basis so the scientists are well trained and take pride in their work, judged by their performance in contributing to growth”. One has need of “a strong role for public sector extension—no point in assuming private sector will do the job”. Essential also are “investments in infrastructure; well-functioning financial institutions; stable predictable input supply; a minimum price support program”. In short, a system has to be put in place, with some elements requiring years to install and to fully integrate.

Time has passed. New fundamentals have thus to be taken into account, complementary to the old ones.

Norman Borlaug was primarily a plant scientist. He was focusing on the farmers and on ensuring that farmers would be exposed to the most adequate technologies, and had access to the necessary inputs. He concentrated less on what happened beyond the farm’s gates, although he acknowledged the importance of what was happening post-harvest. He thus paid attention to the need of smallholders to store and transform, eventually to transport.

But Norman Borlaug lived at a time and in a world where the economic dimension of agriculture had not the importance it has today. It was too often left to economists and development economists. Markets and access to markets, as well as value chains were concepts which were not as commonly referred to as today.

Today, no agricultural transformation can be thought of and implemented without thinking and conceptualizing in economic terms, without the entire agriculture value chain being taken into account, costs and returns being calculated, and more and more

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<sup>38</sup> About SAFE:

*“The need to ensure that agricultural knowledge and technology from research is effectively disseminated to farmers and end users in sub-Saharan Africa to improve profits and livelihoods cannot be overemphasized. As key actors of development tackled a myriad of agricultural production and post-production issues, it became apparent that the extension system, especially the frontline extension agents needed to be equipped with the necessary knowledge, skills and competencies to effectively disseminate crucial agricultural information and technology needed for sustainable agricultural development. Sasakawa Africa Fund for Extension Education (SAFE) has taken the lead in developing responsive, custom-made agricultural extension education and rural leadership programs that reach out development professionals that work directly with rural people to change their livelihoods.”*

(<https://www.agriskmanagementforum.org/doc/sasakawa-africa-fund-extension-education-safe>)

<sup>39</sup>Communication to the author – 12 June 2014.

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without reference to business plans. The primary objective of agriculture development is not so much as before to address poverty, but to transform underprivileged farmers into commercial farmers, thus give them opportunities to become entrepreneurs<sup>40</sup> and participate in the mainstream economy.

Many if not most of the components of the agricultural value chain are still the ones one knows. Research is still fundamental and appropriate research results are still to be transferred to smallholder farmers. The need for farmers to get access to inputs, and thus, as a corollary, to be given credit is more than ever required. The role of the extension agents on the farm is still essential.

What has changed and given increased attention is very much the market, market access, and the pull factor of the market. Costs and prices have become principal elements of the decision making process of the farmers, and of all who are active along the value chain. It was much less the case before. Extension agents are thus not anymore only concentrating on advising on the farm. They counsel, or should counsel all along the value chain.<sup>41</sup>

Finance and investments in agriculture are also increasingly focused upon.<sup>42</sup> Indeed they are part of the equation. More funds are needed in and around agriculture and rural development. Rural infrastructure, which should include schools, hospitals, water access and sanitation, and not only roads and energy imply significant amount of funds. But finance and investments are not enough. They are not a panacea. Prior to any significant investment, one should be certain that funds are spent in the most efficient and effective manner, not to speak of transparency and accountability, as well as fit into an overall vision and strategy.

Would such emphasis on the economic dimensions of agriculture provoke Norman Borlaug? Possibly so. But simultaneously, he would recognize that in many ways the new perspectives and policies on agriculture still give the smallholder farmers a dominant role. He would, if he had not already, acknowledge that to lift farmers out of poverty implies that they can sell the surplus of their production at reasonable and remunerative prices. He would agree that “taking it to the farmers” means today more than transferring agronomic knowledge, but also a much wider and diverse amount of

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<sup>40</sup>See annex below.

<sup>41</sup>On thoughts about the increased role of extension, Cf. Qamar, M. Kalim, *Modernizing National Agricultural Extension Systems: A Practical Guide for Policy-Makers of Developing Countries*. As well as Christoplos, Ian, *Mobilizing the potential of rural and agricultural extension*, FAO & GFRAS, Rome, 2010.

<sup>42</sup>Cf. *Grain Fish Money. Financing Africa's Green and Blue Revolutions*. Africa Progress Report 2014. Africa Progress Panel, London, 2014.

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know-how on post-harvest and market access, including economic and financial literacy, which modern extension agents have to master.

Has the battle Norman Borlaug fought all his life changed very much? He was awarded the Nobel Peace Prize for having helped to “provide bread to a hungry world”. The world is still hungry. Since receiving the Prize in 1970, the world population has doubled<sup>43</sup>. The battle has to go on.

Science and technology continue to have to be at the center stage<sup>44</sup>, and they are, with the imperative that good results do not sit on shelves and are transferred to smallholder farmers.

The main legacy of Norman Borlaug is however elsewhere. He was a man of action, advocating simple, straightforward and no nonsense solutions. This is what one should be inspired by. He was a man who identified in bureaucratic attitudes, turfs battles and red tapes, - one should add corruption - some of the main obstacles to agricultural transformation and changing the life of smallholder farmers. This is what one should be constantly aware of and looking for so to turn around those obstacles. He was a man who felt that endless meetings, studies no one read, cascade of evaluations and reports required by hierarchies dominated by fear and afraid of their own shadows, were preventing and delaying action.

Norman Borlaug was an impatient man. For the sake of the African farmer, we should be impatient too.

Geneva, June 2014

## ANNEX

*Forging the Road Ahead for African Agriculture,*

Report of the meeting held in Crans-Montana, Switzerland, August 28<sup>th</sup> – September 2<sup>nd</sup>, 1994, chaired by Olusegun Obasanjo and Amadou Toumani Touré<sup>45</sup>

## Overall Conclusions

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<sup>43</sup>Total world population – 1970: 3,706,618,163 – 2014 : 7,211,239,210

<sup>44</sup>*Cf.* on agricultural innovation, Juma, Calestous, *The New Harvest. Agricultural Innovation in Africa*, Oxford University Press, Oxford, 2011.

<sup>45</sup>The conclusions of the meeting of Africans, on African agriculture, held in 1994 under the chair of Olusegun Obasanjo and Amadou Toumani Touré are still relevant and inspiring. They are reproduced

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**Developing agriculture in Africa is among the very first priorities.  
It constitutes a prerequisite to the overall development of the continent.**

**Agriculture in Africa has to be thought of differently, in a broad context and beyond the “input output” model, i.e.:**

- Agriculture is primarily an economic activity.
- The farmer is a professional, and among those professionals, there are many possible entrepreneurs who are the first to be encouraged and supported.
- The role of the state in agriculture will always be pivotal, but has to be reconsidered and redimensioned. It has to be circumscribed to appropriate measures of governance aiming to create the right enabling environment through proper legislation and incentives. Some of its responsibilities and tasks should be transferred to the private and independent sectors.
- The development of agriculture implies political stability and security.

#### **Assessment of the situation and conceptualization**

- a. Agriculture suffers from being too narrowly defined and not clearly conceptualized. Too much emphasis is placed on the social role of agriculture. Agriculture, however, is first a viable economic activity. It is good business which can enhance the quality of life. It can bring in added value from the use of natural resources. It thus deserves support commensurate to its potential weight in the economy, for example, in term of investments.

Farmers are central to the development of agriculture. They have to be recognized as economic actors, as professional motivated by the perspective of being cash-rich. They either produce for their own direct consumption or sell for cash on markets, whether local, regional, continental or international.

Most farmers are professionals, but only a few of them are entrepreneurs. Entrepreneurs will innovate, seize opportunities, and bring in the most added value. Three hundred millions or so Africans are more or less closely involved in agriculture. All contribute to the development of agriculture, but some are likely to give more and thus contribute to a multiplier effect.

*The need to empower entrepreneurs and to strengthen farmers' professional capacities is thus essential.*

- b. Agriculture has to be appraised in a wide context. It cannot be only analyzed from the perspective of the availability of inputs, the existence of storage and

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in part here. *Forging the Road Ahead for African Agriculture*, Report of the meeting held in Crans-Montana, Switzerland, August 28<sup>th</sup> – September 2<sup>nd</sup>, 1994.

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transportation capacities, or proper pricing policies neither can it be from the exclusive angle of rural institutional framework, (land tenure, water management, research and development, etc...) Agriculture is part of an overall framework comprising national and international economic and political governance frameworks.

*Agriculture depends for its progress on good governance and stability, in other words, on the right enabling environment.*

- c. The state, in Africa, is often overwhelmed by responsibilities and tasks of all kinds. It is requested to provide general guidelines and regulatory frameworks, and simultaneously render concrete services to the agro-business community. Public administration is often overburdened with activities, many of which it is not structured and organized to perform. It does so at great costs, with insufficient return on investment, frequently inappropriate procedures, little transparency, and in an excessive centralized and bureaucratic way. The result is that it cannot concentrate on priorities and concurrently does not respond in an efficient manner to the needs of both farmers and entrepreneurs. One of the roles of the state is to allow civil society to do what it does best, and where state intervention is needed, to do so without diminishing the power of civil society.

*The state, has thus to be reengineered and civil society – both the private and the independent nonprofit sectors – empowered through the transfer of some of the responsibilities and tasks presently performed by the state.*