



Public-Private Partnerships for Agroindustrial Research: Recommendations from an Expert Consultation

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Public-private partnerships are often promoted as a means to stimulate agricultural innovation in developing countries. Indeed, where research organizations and parts of the productive sector—farmers and private companies—link up, they can bring about innovations that benefit the sector's development.

However, many public researchers, policymakers, company executives, and project managers still need to be convinced that such partnerships bring benefits, not only to the private sector but also to the public sector and to research. Many are hesitant as to when, under which circumstances, such partnerships should be formed. On the one hand, they recognize the opportunity to increase and intensify agricultural production, and so to provide income to farmers and workers in agroindustry while competing in the global market place. On the other, their concern that smallholder farmers might not benefit from the profit made in private agroindustry causes them to oppose the spending of public money that enriches the private sector.

This Briefing Paper reports on a workshop held at the University of Hohenheim in Germany to look at public-private partnerships in agroindustrial research. Following a definition of relevant terms, it presents the outcome of case studies carried out in Costa Rica, Ecuador, the Dominican Republic, and Paraguay, as well as supplementary experiences in Germany and Africa. The paper also presents policy statements developed by workshop participants and suggests future steps for making public-private partnerships a more useful tool for agroindustrial development.

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The workshop and the project

This Briefing Paper synthesizes the presentations and discussions made during a workshop on public-private partnerships for agroindustrial research in development, held at the University of Hohenheim, Germany (ISNAR/University of Hohenheim 2002). The workshop formed part of ISNAR's project on Public-Private Partnerships for Agroindustrial Research in Latin America (the PPP project).

The PPP project aims to foster institutional innovation in agroindustrial research through the promotion of public-private partnerships. Under the project, public- and private-sector professionals from the region work together to learn about public-private partnerships in the field of agroindustrial research and to devise ways of strengthening them.

The project's activities are as follows:

1. sensitizing the public and private sectors in the region with regard to the importance of agroindustry research and partnerships, and subsequent training;

2. implementing public-private partnerships for agroindustrial research in three pilot countries: the Dominican Republic, Ecuador, and Paraguay;
3. undertaking research studies on specific issues associated with public-private partnerships, such as governance, finance, legal aspects, and evaluation.

The workshop brought together various experiences with public-private partnerships in the region, including three characterization studies conducted in the pilot countries. The aim was to use this information to plan the research studies.

The workshop was attended by 35 professionals from both public and private organizations involved in agroindustry research. Private companies, academia, and research and development agencies from Germany, Latin America, and Africa were all represented.

Towards a consensus on terminology and approaches

The first exercise was to build consensus on the key terminology related to agroindustry, research, and partnerships. The definitions agreed upon are given as follows:

- **Agrichains** (or, more generally, supply chains) are industrial arrangements that allow buyers and sellers who are separated by time and space to progressively add and accumulate value as (agricultural) products pass from one member of the chain to the next (Hughes 1994).
- **Agroindustries**, in the narrow sense, are those economic entities that process materials from primary agricultural/animal production, forestry, and fishery; the processing can include transformation and preservation through physical or chemical alterations, storage, packing, and distribution (Austin 1992). To improve understanding of how agroindustrial development evolves, the PPP project sometimes applies a broader definition, whereby agroindustry embraces all the activities in the agrichain and becomes synonymous with agribusiness.
- **Agribusiness** covers all market activities and includes all private business-oriented entities involved in the production, storage, distribution, and processing of agribased products, and in the supply of production inputs and the provision of private forms of services such as extension, administration, and research.
- **Postproduction** includes postharvest storage, transformation, distribution, and marketing of agricultural products.
- **Innovation systems** consist of institutions that contribute individually and interactively to the development and diffusion of new knowledge and technologies.
- **Innovation** is the search for, and discovery, development, experimentation, imitation, improvement, and adoption of new products, processes, and new organizational structures and procedures (Jorde and Teece 1992). Innovation is a highly interactive and interdependent process, characterized by high risks and uncertainties, which occurs in social systems and entrepreneurial units.
- **Research partnerships** are cooperative arrangements for conducting joint research between two or more organizations (public-private) and involving the exchange/sharing of resources in order to attain a common goal.
- **Public-private partnerships** are a contractual arrangement whereby, according to a shared ownership agreement, the resources, risks, and rewards of both the

public agency and the private company are pooled to create greater efficiency in the production and provision of public or private goods. The term classifies a spectrum of possible relationships oriented variously to the development and dissemination of wholly public or relatively private goods.

- **Knowledge brokers** act as an intermediary between farmers, researchers, and other stakeholders that demand or supply information or products in the agrichain. A knowledge broker can participate in a public-private partnership.

Results of the characterization studies

From November 2001 to May 2002 six local experts conducted characterization studies in the three case study countries—Ecuador, the Dominican Republic, and Paraguay. They investigated the agroindustry sector, the research system, and existing initiatives for public-private collaboration in agroindustrial research in those countries. An additional analysis was undertaken by a Masters student from the University of Hohenheim who was conducting fieldwork in Costa Rica. The findings of these studies are summarized below.

The agroindustrial sector in **Ecuador** suffers from low competitiveness compared with other Latin American countries. Agroindustrial productivity is half that of Colombia and less than half that of Chile and Costa Rica. The private sector is polarized, with some large-scale industries involved in the processing of, for example, meat, shrimp, potato, cocoa, and sugar, while the remainder of the sector is dominated by small-scale farmers and cooperatives involved in artisanal processing and informal marketing. Both types of enterprise need innovations in processing to maintain and improve their profitability, and both put pressure on research to provide such innovations. Public-private partnerships have been little exploited as a development tool in Ecuador. This is thought to be due to the lack of a conducive policy environment, legal insecurity, and political and economic instability. In government policy, agriculture generally ranks low in priority, and the country has weak public research and development institutions. Furthermore, it is difficult to establish stable partnerships in Ecuador's highly challenging political and economic climate, where there are often open and severe conflicts of interest. However, the Corporation for the Promotion of Exports and Investments (CORPEI), a parastatal linked to the Ministry of Trade, Industrialization, and Fisheries, has recently put forward some bold measures in support of agrichain development that will help build a platform for public-private partnerships, be it in research or other areas.

In the **Dominican Republic**, the performance of the agricultural sector is poor compared to that of other sectors. Government support for agricultural development has been limited, competitiveness is low, and per capita production has fallen below the levels achieved in the 1960s. Recently the government has developed new policies intended to improve farm efficiency and add value to agricultural products. A major constraint to the more efficient use of the country's agricultural resources is the poor performance of the national research system. Agricultural research in the Dominican Republic suffers from limited financial, infrastructural, and institutional capacity. Many research entities see public-private partnerships as a possible solution to these problems, but successful examples of such partnerships are not yet available. Many private agroindustry companies express skepticism with regard to the effectiveness of public research services, making them unwilling to fund research and development. Despite this, some partnerships are now up and running, for example between the Agricultural and Forestry Research Institute (IDIAF) and private companies in the tobacco and dairy sectors, and others, for example in the sugar, rum, cocoa, and potato chip sectors, are being formed.

In **Paraguay**, there is ample demand for agroindustrial research. The agricultural sector is roughly divided into two parts:

1. Efficient medium- to large-scale farmers who seek to compete with neighboring countries, such as Brazil and Argentina, and who therefore need to respond to the demands of an existing, relatively efficient agroindustry. These farmers need research results that will increase the quantity and quality of their primary production.
2. Small-scale farmers with little access to inputs and services. These farmers seek to improve their livelihoods by making better use of their available resources and adding value to their produce. They need help from research to improve the efficiency and sustainability of their enterprises, diversify into new products, raise the quality of their produce, and add value through better processing.

For the past 20 years the agroindustrial sector, despite its considerable capacity, has remained small in relation to the overall economy, and the share of primary agricultural production in gross domestic product (GDP) has even fallen. However, recent policy reforms show that the government now considers the export of value-added agricultural products as a critical strategy for raising incomes and fighting poverty in rural areas. The creation of the National Council of Science and Technology (CONACYT), which has a mandate to stimulate and promote innovation and development and to formulate sectoral policies, suggests a more integrated vision of development in which the public and private sectors work

together. In 2001, the government, in response to private-sector interests, also created the National Organization for the Promotion of Market Competition (ONPEC). This organization's objective is to promote the development of regional agroindustrial "clusters" by integrating the public and private sectors. ONPEC supports training activities and facilitates institutional development. Its activities include implementation of the national plan for exports, development of quality-control systems, development of communication infrastructure, and modernization of the national credit system.

Agricultural research in **Costa Rica** is carried out by a range of publicly and privately funded organizations. The national banana corporation (CORBANA) and the Costa Rican Coffee Institute (ICAFFE) are funded exclusively by the private sector (through a levy), while the Costa Rican Chamber of Food Industry (CACIA) is funded partly by the private sector and partly by acquired project funds. Public-private partnerships already exist, for example the alliance between the Biodiversity Institute (INBIO) and the pharmaceutical transnational MERCK, and the partnership between the Centre for Food Technology Research (CITA) and processing cooperatives in the *palmito* (dwarf fan palm) sector. A number of funding mechanisms have recently been set up in the national research system that have the potential to support partnerships in research. However, public-private partnerships are limited by the lack of credibility of public research. In a recent survey of private agroindustry companies, 60% of interviewees responded negatively when asked for their opinion on public research. The interviewees perceived public research to be too expensive, incompetent, over-academic, lacking application, and bureaucratic. In contrast, a survey of exporting and nonexporting companies found that companies were in dire need of innovation, particularly those involved in exports (70% of exporting companies said they were searching for product innovations).

Overall, the characterization studies showed that there are many collaborative initiatives in agroindustrial research between public research institutions, private agroindustry companies, and farmers' organizations. However, such initiatives are usually driven by public funds, and virtually none have resulted in an effective, ongoing partnership with financial commitments from both sides and a legally binding contract. "Real" partnerships are thus rare in Latin America. Our preliminary analysis suggests that, although they often claim to focus on adding-value and improving competitiveness, national agroindustry policies in fact do little to support research aimed at improving national agrichains. There is seldom a guiding framework for coordinating the different elements that support agroindustry development, such as transport, credit, extension, technology development, and market information. Public agricultural research suffers from severe structural and institutional problems, and these problems pervade any partnership initiatives undertaken by such organizations.

Partnerships also suffer from a general lack of trust between the public and private partners, due to past misunderstandings, mismanagement, and the poor performance of research.

Despite this negative overall assessment, the partnership option does seem to be gaining ground; in some cases it is even adopted as a survival strategy. A more positive attitude towards collaboration is gradually emerging and in some cases, shown by the country study teams, this has already translated into a functioning partnership. However, the experience gained from the few partnerships studied in the case-study countries is as yet too limited to say whether the benefits of these efforts exceed their economic, social, and environmental costs.

Further experiences from Germany and Africa

Experiences from agroindustry research and development in Germany and Africa were also presented at the workshop.

The representative of an association of medium- to large-scale agroprocessors in Germany outlined the research needs of the private sector and described how to set up public-private partnerships. The private sector is highly interested in research conducted by various German research organizations, such as the Max Planck institutes, universities, and particularly the research laboratories of other private companies. Research needs lie in product development, new production methods and processes, marketing, public relations, training and learning methods, benchmarking, and the intelligent use of human capital. Partnerships can be established as a result of either private or public initiatives. In both cases it is important to draw up a contract that includes a clear problem statement, the research approach and plan, and the human resources, time, materials, and costs required. When a public research organization initiates the partnership, it must substantiate the case for research by showing that there is no alternative supplier in the private sector. The representative concluded with the observation that, when partnerships are well planned, both private agroindustry and public research usually benefit significantly.

The representative from a transnational agrochemical company based in Germany talked about how to identify and use the common interest space between the private and public sectors. For example, private industrial crop protection research aims to find new active ingredients, elucidate their mode of action, define optimal application, and find new uses for existing products, while keeping costs low and profitability high. The main objectives of public research institutes dealing with crop protection are teaching, basic research (which matches with finding new active ingredients), and applied research (which corre-

sponds with defining optimal applications), while such institutes also face challenges in funding (which matches with the private sector's need to keep costs low by outsourcing research). Two examples of successful public-private partnerships were presented: first, a joint effort to combat fire blight, a bacterial disease affecting fruit trees, and second, the discovery of a new and very successful type of fungicide.

The representative of the University of Hohenheim's Centre for Agriculture in the Tropics and Subtropics dealt with the issue of how far public research oriented towards the needs of poor rural people in the tropics can be subject to public-private partnerships. Rates of return on investment in agricultural research are usually high, but the outcome is often a public good that is of little interest to profit-oriented private companies. However, there are cases of agrichain development where the private sector can be involved. For example, in a project on the development of plant fibers, a single component of the chain may be of interest to a private company and hence attract its financial commitment, while other development goals may be addressed by the project as a whole, which may have substantial knock-on effects. However, goals such as alleviating poverty and hunger among the rural poor, fostering sustainable smallholder agriculture, and protecting the environment *per se* are as yet of little interest to the private sector.

The representatives of research organizations in Africa—the International Institute of Tropical Agriculture (IITA), ISNAR, and the West Africa Rice Development Association (WARDA)—focused their presentations on the need for a more prominent role for agroindustry research in the development agenda of African countries. In the infant agrichains of Africa the bottleneck for development is not the supply of technology but poorly functioning markets.. Nonfunctioning markets are caused by a lack of entrepreneurial skills, the high costs of transportation, and the unavailability of credit. Support for maintaining market intelligence under rapidly changing market conditions is particularly needed. Research must not only adapt to changing market conditions but also aim to develop the business support services that can evaluate market options, including high-value market segments. Partnerships enabling market-oriented agroindustrial research are all too rare in Africa, and there is an urgent need to invest in this area. Under such partnerships, the private sector would often have to have access to public research institutes and universities, since these provide the only research capacity in the region. Similarly, the public sector would need to form strong links with the private sector in order to increase its relevance to people's needs while still maintaining its traditional orientation towards development that is sustainable and equitable. A few "off-shore" public-private research partnerships, in which transnational agroindustry companies contract local public research organizations, already exist in Africa, but they do not particularly need support. Instead, public research

should aim to fill the vacuum created by the absence of strong national private sectors by promoting the development of efficient local agrichains that involve small- to medium-scale producers, processors, and consumers.

Policy statements

Based on the analysis above, participants split up into working groups to develop policy statements on the role of agroindustry in development, the role of agroindustry research, and the role of public-private partnerships, both in general and for the particular cases of Latin America and Africa.

Agroindustry in development

Agroindustrial processing reduces the seasonality of agricultural produce, improves and stabilizes product quality, and prolongs shelf life. All these effects add value to primary production, creating employment and raising incomes for rural and urban producers, processors, and traders. Processing also provides a more convenient and attractive product to consumers, who demand reasonably priced, safe, and high-quality food. The introduction of agroindustrial products can also stimulate the growth of retail outlets, including supermarkets. Agroindustry diversifies the use of primary products, leading to reduced volatility in market prices, which benefits both the primary producer and the consumer.

The leading Latin American countries in agroenterprise include Argentina, Chile, Brazil, and Mexico, which have all developed a sizeable agroindustry sector. In the other Latin American countries agroindustry is less developed but is growing. Nonfood agroindustry, and particularly industry related to the use of biotechnology, will become more important, be it through the intervention of transnational companies or through local initiatives. The use of certification and quality control measures will also increase, as healthy, organic, and nutritional products gain market share. In many cases this trend will be driven by consumer demand. There is a risk that farmers and processors who fail to integrate into agrichains may be excluded from these expanding markets and be restricted to less profitable ones. To achieve balanced, equitable development in the agroindustry sector, public intervention is vital. To make agroindustry development happen, governments, in consultation with the private sector, will need to define and implement supportive policies. Such policies, which will have to be tailored to the specific characteristics of different agrichains, will need to embody a clear commitment to develop the national capacity in relevant science and technology.

Agroindustry research

Knowledge and innovation are prerequisites to the development of agroindustry. Latin America's existing knowledge and innovation systems are, with a few exceptions, unable to convey the necessary information to initiate the development of agroindustry. Frequently, technology from the developed world (predominantly the USA and Europe) is merely copied, without regard for its appropriateness in the local setting. In many cases, transnational companies are able to penetrate local markets for high-value consumer products through joint ventures. But the knowledge and technology needed to support the development of local processing on a small or medium scale is missing. Indeed, the development of small to medium-sized rural and urban agroprocessing and marketing enterprises is only achievable with knowledge and technology that responds to local social, economic, and cultural needs.

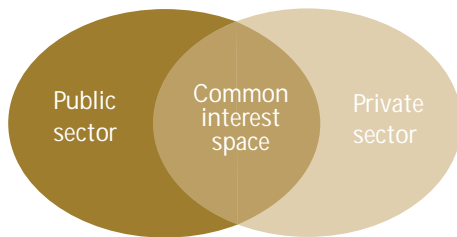
Many local agroindustry companies now understand the importance of knowledge for penetrating and maintaining competitive markets, but many more have yet to learn the lesson. New consumer demands create new products whose manufacture requires the latest agroindustrial technology. National research must generate some of these new technologies and adapt them to local conditions, but copying innovations from other countries with similar conditions is a necessary complementary strategy.

Agroindustrial research should be an integral part of the management of agrichains. In this regard agrichain management also needs to set research priorities. Round tables on sector or agrichain development are promising forums for identifying research needs. Public organizations involved in agrichain development must acquire the skills needed to deal with the private sector, for example negotiating skills and the ability to promote new ideas. Researchers also need to become knowledgeable about the problems and opportunities in agroindustrial development as perceived by specific sectors.

Public-private partnerships in general

Partners tend to link up if they think they have something to offer and to gain. However, it is only when they clearly see a common interest that they will commit themselves substantially to a partnership by contributing material or intellectual resources. The objectives of the two partners may be very different, but there can be, although will not necessarily be, a common interest space in which activities will respond to objectives shared by both partners (see figure 1, and also box 1 for an example). Discovering the common interest space can be difficult, however, and often it is so well hidden that it remains undetected.

Public-private partnerships are a promising option for meeting agroindustrial research needs because they tie research closely to users' needs, provide opportunities to

Figure 1. The common interest space

Box 1. Eco-glue for banana packaging

The Latin American and Caribbean Consortium to Support Cassava Research and Development (CLAYUCA), supported by the Centro Internacional de Agricultura Tropical (CIAT), recently developed a method for processing cassava starch into glue that can be used in ecological packaging, for example, of bananas. The technology is not yet commercial and some further applied and adaptive research needs to be conducted to bring it to market. A public-private partnership has therefore been initiated in which a private starch-processing company in Ecuador provides the operational funds for further technology development. The work will be carried out by a food chemistry specialist at the National University of Colombia in Bogotá. CLAYUCA provides the institutional framework for determining the necessary inputs of staff time and funding and also the distribution of benefits, such as those accruing from an eventual patent, between the partners.

improve efficiency, and can augment investments in research. Consequently, research through public-private partnerships should have a greater impact than public- or private-sector research alone. In the developing countries, such research would broaden the perspectives of the two sectors and greatly strengthen their contribution to a better future.

Public-private partnerships in agricultural research can only develop in a network of institutions whose activities in the agrichain are integrated. They cannot develop in an environment where each actor seeks its independence. Hence, such partnerships are few in number and weak in most developing countries. Until now, the partnership concept has not been well understood or promoted. Public-private partnerships often face legal barriers and the human and financial resources allocated to them are still far too limited. Such partnerships as do exist often depend on public or donor funding and enjoy no real (financial) commitment from the private sector. Given this situation, it will be up to governments to take the lead in developing partnerships, focusing first on the most innovative areas of public research in higher value-added product markets. Strengthening the governance mechanisms of research

partnerships is a promising strategy for improving their performance. Synergies would also arise from better priority setting.

Public-private partnerships in Latin America

In Latin America, public-private partnerships in agroindustrial research can facilitate a dialog between public and private stakeholders in agrichains. They promote the “rationalization” of development efforts: public research becomes more focused on the needs of the private sector and private-sector development efforts are guided towards areas where they also make public sense. Public-private partnerships will also create synergies in the use of existing human, financial, and physical resources for agroindustrial research, which are scarce throughout the continent.

To date, public-private partnerships in Latin America have tended to evolve spontaneously, without an effective conceptual and operative framework. To consolidate and develop such partnerships in agroindustrial research, the focus should be on involving well-established private companies operating in dynamic markets, such as the poultry, beer, or starch sectors, where the policy environment is also relatively stable. In the meantime, public-sector research needs to become a stronger partner, with a better-developed capacity in state-of-the-art science and technology, which it is willing to deploy collaboratively at a cost that appears reasonable to prospective partners. Both sides need to contribute sufficient resources to the partnership. Making competitive funds available may help marshal the necessary resources.

Conclusions

It is becoming increasingly clear that efforts that pioneer new approaches to institutional innovation in agricultural research in Latin America—such as ISNAR’s PPP project—are responding to an emerging paradigm in which the guiding principle is to integrate public nonprofit interests with private entrepreneurial interests. These new partnerships are about finding shared interests and balancing diverging ones. The rationale for such integration is that, if we get it right, then the welfare effects are greater than when research and development are conducted in the two sectors separately. Against the backdrop of this changing worldview, we see many congruent changes occurring in both the private and public sectors.

In the private sector, competitiveness requires the in-depth understanding of markets and of quality standards. It also requires cost-effective and quality-sensitive technologies, as well as improved decision making. The practical response to the pressures exerted by ever-greater competition is to integrate vertically in order

to manage the supply chain more efficiently. Formerly it was imperative to produce more; now adding more value is becoming the key factor driving development. Most private-sector companies have stopped trying to do everything themselves but rely heavily on all kind of external services, suppliers, and partnerships. Research partnerships are just one of the many kinds of partnership they may be involved in.

In the public (agricultural research) sector, we see that the autonomous institute, with an independent program attracting core funding coming from a single source, is increasingly being replaced by a more interdependent, consortium-based approach in which funding comes from diverse sources (different ministries, regional governments, producer federations, agroindustry companies, etc.). This means that the overall program must integrate the different objectives imposed by each funding source. Research organizations are no longer free to follow their own objectives but are tied much more firmly to the objectives of a broader range of organizations representing different stakeholder groups.

What does it take to integrate the objectives of different organizations in a partnership? Many of the most useful comments in the workshop referred to administrative and intellectual flexibility; to the ability to communicate and to work in a team; to the ability to recognize and respect different interests; and to the willingness to share risks, for example in market development. The most frequently mentioned mechanism for creating partnerships and making them work was the agricultural-sector committee. Such committees, which assemble representatives from different interest groups in a given sector, agree on the sector's development priorities and derive a research agenda based on these priorities. They imply that the governance of public-private research partnerships may be best placed outside the partner organizations and that the success of these partnerships may hinge on the development of appropriate forums for consultation and negotiation. Other requirements may still arise: integration is not by itself going to lead to equitable, sustainable development and a key aim in designing all public-private partnerships in agricultural research and development must be to ensure that they do not contribute to the further marginalization of already poor people.

What next?

In general, the experience of the PPP project suggests that public-private partnerships in Latin America partnerships have so far arisen spontaneously, without the necessary conceptual and operative framework to ensure that such partnerships contribute effectively to sustainable, equitable development. The findings from the workshop suggest that governments seeking to use public-private

partnerships as a tool in agroindustrial development need to reflect carefully on where and how to apply them.

To ensure that partnerships are effective, the focus should be on involving only those private companies that are well established and that operate in dynamic markets. In addition, the activities of these companies must be compatible with public development goals. Public-sector research partners need to be strong and have the necessary capacity in state-of-the-art science and technology. They also need to be willing to enter a partnership on reasonable terms, acceptable to other partners. Both sides need to contribute sufficient resources to make the partnership work, and they need to interact positively, on the basis of mutual trust and a proper acknowledgment of each other's interests.

The PPP project does not see itself promoting partnerships in isolation; there are numerous government, private-for-profit, private-nonprofit, and regional and international initiatives whose aim is to promote and sustain agricultural and agroindustrial development. Most of these initiatives focus on agrichain development and the PPP project sees itself contributing to and interacting mainly with this category.

The challenge facing the PPP project is to identify the minimum set of conditions that must be met in order to establish effective and equitable partnerships. The project will seek to identify the different governance, funding, and legal arrangements used in partnerships, and to analyze their effects on partnership performance. In the pilot countries—Ecuador, the Dominican Republic, and Paraguay—the project will use the experience gained so far as a basis for establishing models of functioning agroindustry partnerships. The project will lead to the publication of a series of research reports and of a manual. The manual will help organizations to decide whether they need a formal partnership, the form such a partnership should take, how it can be developed, and when it must be ended.

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