FRESHWATER COUNTRY PROFILE

GHANA

Decision-Making

Programmes and Projects

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Decision-making: Over the past decade, some initiatives have been undertaken to address some of the problems that constrain the sustainable development and management of the country's water resources, particularly to streamline the role, functions, and decision-making processes within the water sector. These include water sector reforms coordination of national water resources management and strengthening of Water Resources Information and Development Agencies.

Rural Water Reform: Following a review of the results achieved by Ghana at the end of the International Drinking Water Supply and Sanitation Decade (IDWSSD) in 1990, reforms were introduced in the early 90's in order to accelerate the coverage of the rural population with good drinking water and sanitation facilities. The Rural Water Department of the Ghana Water and Sewerage Corporation (GWSC) was separated and set up as an autonomous Community Water and Sanitation Agency (CWSA) by an Act of Parliament in 1994. A new policy was introduced that requires that supply of water to rural communities be demand driven, and community managed. The communities are also required to make a contribution of 5% of the capital cost of providing the facility.

Urban Water Reform: Reforms in the urban water sector included a Water Sector Rehabilitation Project that was begun around 1995. Subsequent to the rehabilitation programme, further reforms have been undertaken, and are intended to create conditions (through legal, business and regulatory interventions) to facilitate a favourable environment for increased private sector participation. Ghana Water and Sewerage Corporation was also transformed into a limited liability company, Ghana Water Company Limited (GWCL), as one of the many steps for introducing the private sector to the management and operation of urban water supply systems.

As part of the reforms, the regulation of urban water and other services have been shifted away from government to an independent body, the Public Utilities Regulatory Commission (PURC). The PURC is mandated to regulate and oversee the provision of utility services, including approving tariff levels and drinking water quality for treated water to consumers. The Commission is to ensure protection of consumer interests, while at the same time maintaining the balance between tariff levels and investment, operation and maintenance costs of the utility services that will encourage private sector participation in provision of these services.

Irrigation Development: The Irrigation Development Authority (IDA) is responsible for the formulation of plans to develop water resources for irrigated farming, livestock improvement and fish culture. The reforms in the irrigation sub-sector were to accelerate the slow pace of development of the potential 346,000 hectares of irrigable land, out of which only 10,000 hectares have been developed to date. The reform strategy was to increase agricultural production through development of water resources for irrigation with a focus on small scale to medium scale irrigated schemes.

Protection of Water Resources: Reforms aimed at protection of water and the general environment were rooted in the Environmental Action Plan prepared for the country in 1991. Further to this, an Environmental Protection Agency (EPA) Act passed by parliament in 1994, conferred regulatory and enforcement powers on the EPA. The EPA has responded by providing guidelines for developments that affect the environment and setting standards for emissions and discharges into the environment. The Agency has also developed an Environmental Impact Assessment procedure backed by appropriate regulations that must be followed for approval of development projects. These reforms are aimed at ensuring a sustained development and management of resources and the environment to avoid exploitation of resources in a manner that might cause irreparable damage to the environment. The EPA works in close collaboration with the Water Resources Commission (WRC) on all water-related issues.

Water Resources Management: The above reforms by their sectoral nature and approach could only improve and make more efficient the existing water resources sub-sectors but could not in themselves achieve integration of water resources planning, development and management. A significant step was taken by government to address the diffused state of functions and authority in water resources

management to an integrated form. Accordingly, the Water Resources Commission was established by an Act of Parliament (ACT 522 of 1996) with the mandates to regulate and manage the country's water resources and to co-ordinate government policies in relation to them. The composition of the Water Resources Commission is made up of technical representatives of all the main stakeholders involved in development and utilisation of water resources (i.e. Hydrological Services, Water Supply, Irrigation Development, Water Research, Environmental Protection, Forestry, Minerals), and other interests such as those of traditional rulers, NGO's, and Women.

Programs and Projects:

A. Integrated Water Resources Development and Management: In early 1996 the government initiated a Water Resources Management Study (WARM) which identified key water resources issues and challenges and further recommended that Ghana adopt an integrated cross-sectoral approach to water resources management, using the river basin as a unit of planning and management. The choice of Integrated Water Resources Management (IWRM)) approach is therefore aimed at promoting a change from the unsustainable to sustainable water resource management by widening the analytic framework and by inviting all stakeholders to participate in the management of the resource.

So far, Ghana's experience with IWRM has gradually accumulated over the last 5 years or so and may be said to be in the operational phase. The process began with the DANIDA "Support to the Water Resources Commission, Phase 1' programme, which commenced in 2001 and became an integral part of the DANIDA supported WSSP-I cluster of components winding up by the end of 2003. (See details under Status)

In collaboration with DANIDA, the WRC is in the process of implementing a planned second five-year follow up IWRM Component Support programme (2004 – 2008) that focuses on priority areas, which are assessed to be of major importance and provide a strong profile on the water resources scene at national level.

The programme specifically aims at further enhancing the capacity of WRC and collaboration with data and information institutions in fulfilling its mandated role, with a focus on water demand and abstraction regulation, pollution monitoring and water resource assessment activities for effective planning at the basin level. It also aims at further developing and making operational a viable and sustainable institutional framework for decentralised IWRM initiatives at river basin level building on lessons learnt in the Densu and White Volta river basins pilots and new experiences to be gained from similar activities in additional basins to be included under the follow up programme.

B. Water Resources Assessment: Various aspects of water resources assessment are undertaken by Water Research Institute (WRI), Hydrological Services Department (HSD) and Meteorological Services Department (MSD) supported by the Government of Ghana and some donors. The major components are Surface, Groundwater and Water Quality Assessments. River flow characteristics, groundwater potential and water quality characteristics for both surface and groundwater of the country have been studied by the Water Research Institute. Specific Research projects undertaken in the various divisions include sustainable water use under changing land use, rainfall variability and water demand in the Volta basin.. This project was started in 2000 as an integral component of the Global Change in the Hydrological Cycle (GLOWA) project supported by the Government of Ghana and the Federal Republic of Germany. Biological control of water hyacinth in the Oti and Tano Rivers was undertaken between 1999 and 2001.

The Kakum and Daka Watershed Management Projects have also been initiated by Government to seek the intervention of all stakeholders, including research institutions, NGOs, District and Municipal Assemblies etc. to find a permanent solution to the acute water shortage problems confronting Cape Coast township and its environs and some districts in the Northern Region.

The planning for allocation of water for various uses involves a substantial amount of information collection, collation and storage as well as assessments of climate, hydrological and socio-economic

variables to be able to model future scenarios. With the assistance of DANIDA, a Water Resources Information Services (WRIS) Project was initiated and implemented over a seven-year period (1997-2003) to improve the capacity of data generation and research institutions for the improvement of data collection networks and assessment techniques. The WRIS institutions include the Water Research Institute of the Council for Scientific and Industrial Research (CSIR), Hydrological Services Department and the Meteorological Services Department. The project was pursued with regard to equipment, procedures for observation, transmission, processing, storage, retrieval and dissemination to bring up the adequacy and quality of information and ensure continuity, accuracy and regularity of data.

Under the DANIDA Support Programme for the five years period, 2004-2008, water resources assessment activities to be undertaken include the following:

- Improving the surface water hydrometric network in selected basins. It is necessary to build additional gauging stations or improve existing sites particularly in selected priority basins.
- Standardisation of documentation on hydrogeological data and groundwater assessment: The aim is to carry out proper documentation of all available hydrogeological data and information in digital form.
- Monitoring groundwater resources and their occurrences. Monitoring of groundwater regime could provide data for the investigation of some important hydro geological phenomena, and proper assessment of groundwater availability.
- Assessing sediment load for water resources management. Analysis of sediment quantity and rate of sedimentation will help to monitor and address issues of dams' siltation and loss of arable land due to soil erosion.
- Assessing biological indicators of pollution: Biological and physico-chemical assessments are expected to give a more accurate picture of the stresses on the quality of natural waters.
- Strengthening the Geographical Information System (GIS) skills and applications to enhance data management and database operations.

C. Protection of Water Resources, Water Quality and Aquatic Ecosystems: The Water Resources Commission has prepared Raw Water Quality Guidelines that specifically set raw water quality parameters with specific guidelines for both surface and groundwater in the major river basins of the country for various potential uses. A National Water Quality Monitoring Programme has been developed and will be implemented from 2004 to 2008 under the WSSP-II. As a first step towards preparation of the programme, a Raw Water Quality Monitoring Guideline for the Coastal and Western river systems in the country have been developed.

Consultations are ongoing between the Water Resources Commission and the Environmental Protection Agency aimed at preparing a Memorandum of Understanding (MoU) on wastewater discharges and pollution of water bodies and the respective roles to be played by each institution.
The Water Resources Commission is initiating studies under the Water Supply and Sanitation Programme, WSSP-II (2004 – 2008), to develop and establish a uniform buffer policy for riverbanks, reservoirs, lakes, etc., to address the current varying buffer zone demarcation statutes for the protection of water resources. So far, the WRC has completed the compilation of information on various buffer zone demarcation policies and regulations.

D. Drinking Water Supply and Sanitation: The Government has adopted a National Community Water Supply and Sanitation Policy (NCWSP) and prepared a Strategic Investment Program (SIP) (2003 Edition) to rationalize the rural water and sanitation sector to promote and improve the delivery of water and sanitation services in terms of economy, efficiency, effectiveness and satisfaction. The NCWSP requires an accelerated provision of potable water and hygienic sanitation facilities in a congenial environment in rural areas based on demand driven approach and community ownership concept.

The program aims at supporting the country to meet the Millennium Development Goal of accelerated coverage of water supply and sanitation services to assist in reducing poverty and providing

sustainable social and economic developments in conformity with the Ghana Poverty Reduction Strategy (GPRS). The goal of the NCWSP is to increase access to safe and sustainable water and sanitation to improve health and living standards of the rural population, thereby contributing to the achievement of the national target of 85% for water supply and sanitation coverage by the year 2015 and 100% by 2020. It involves infrastructure provision, community development, capacity building and training, project management and technical assistance.

E. Water and Sustainable Urban Development: A Water Sector Rehabilitation Project was put in place from 1992 to rehabilitate 34 major urban water supply systems and to restore into operation 57 broken down smaller urban systems of the 208 urban water supply systems, and also to provide spare parts, plant and equipment to make the systems operational. These rehabilitation works were intended to restore the systems to their original design capacities.

Subsequent to the rehabilitation programme, a Water Sector Restructuring Program (2003-2009) is planned to increase urban water availability. The specific aims are to extend distribution networks especially to low income consumers, assist the sector to establish a sustainable financial foundation, and support the introduction of private sector participation into management and operation of the water supply systems under management and/or lease contract arrangement. The implementation of private sector participation in urban water supply will lead to the removal of government subsidies thus making water delivery sustainable.

The implementation strategy is through civil works program to improve water supply by providing new production and transmission facilities and rehabilitating production and transmission facilities of 80 existing urban systems. The strategy is to restructure Ghana Water Company Limited by providing it with technical and financial support including assisting it with monitoring of the private operators and assets management.

F. Water for Sustainable Food Protection and Rural Development: Programmes and projects that address the issue of sustainable agriculture include: the Land and Water Management Project and the Special Programme for Food Security, which emphasizes water conservation.

The objective of the Small Scale Development Project is to increase crop productivity by having 6000 smallholder farmers cultivating an area of 2590 ha under irrigation or improved water management. The objective of the Kpong Irrigation Project was to develop irrigation facilities to increase crop production for food and increase income for farmers. The project ended December 2001.

G. Impacts of Climate Change on Water Resource: With support from the Netherlands Government Climate Change Studies Assistance Project (NCCSAP) the country developed national climate change scenarios and climate change vulnerability assessment studies for water resources and the coastal zone. Because of the impact of water resources and climate on agriculture, the impact of climate change on agriculture was also studied.

Major findings were that in the last 30 years the temperature has risen by about 1 ºC and the corresponding reduction in rainfall and stream flows were 20% and 30% respectively. Runoff was found to be sensitive to changes in precipitation and temperature for example 10% change in precipitation or 1ºC rise in temperature causes a reduction of more than 10% in runoff.

Flow reductions of between 15-20% and 30-40% were observed for simulations using climate change scenarios for years 2020 and 2050 respectively. From the simulations, the reduction in groundwater recharge was between 5-22% by 2020 and 30-40% by 2050.

The rise in minimum and maximum temperatures was highest in the Sudan Savannah. Yield of maize was predicted to decrease by 0.5% in 2000 and by about 7% in 2020. Yield of millet was not affected, as it is more tolerant to higher temperatures.

Irrigation water demand could be affected considerably by climate change. In the humid part of the country, the increase in irrigation water demand due to climate change by 2020 and 2050 are about 40 and 150% of the base period water demand. For the dry interior Savannah, the corresponding increase in 2020 and 2050 are about 150 and 1200% respectively.

Hydropower generation could seriously be affected by climate change. The projected reduction by 2020 is about 60% from the base value in the Pra basin.

In the Coastal Zone a total of 1,110km^2 of land area may be lost as a consequence of a 1m rise of sea level. The population at risk is 132, 200, mostly located in the East Coast. Important wetlands especially in the Volta Delta may be lost due to land erosion and inundation.Increased water depths and salinization of lagoons as a result of sea level rise will impact adversely on the feeding of migratory and local birds.

In order to address contingencies resulting from extreme hydrological events and other natural disasters, the National Disaster Management Organisation (NADMO) was established by Act 517 of 1996 and tasked to be responsible for all disaster types and phases in Ghana. NADMO prepares for pre-disaster, disaster, and post-disaster phases. In order to accomplish its objectives, NADMO has set up seven (7) Technical Sub-Committees to cover all types of disasters in Ghana, such as geological and hydro-meteorological, pest and insect infestation bushfires and lighting, epidemic outbreaks, and relief and reconstruction disasters.

Status: *Integrated Water Resources Development and Management:* The current status of Integrated Water Resources Management (IWRM) in Ghana is as follows**:**
Draft Water Policy A draft Water Policy has been developed that aims at the conservation of the nations water resources through efficient management and utilisation in a sustainable manner to ensure that the socio-economic development of Ghana is not constrained at any time by limited and poor quality water resources.

Specific guidelines for action to ensure effective implementation of government responsibilities are outlined under the broad areas of sustainable management of water resources; access to safe and adequate water and sanitation; water for food security; mitigation of extreme events; participation; research; information and public awareness; capacity building; international cooperation; institutional coordination; financing; and good governance.

Water Use Regulation: As part of its mandate, an initial focus of the WRC was to regularise water rights for existing water users and the granting of water rights to all users of naturally occurring water. Water use regulations and procedures for the issuance of rights to water uses by means of permits was prepared by the Commission and passed by Parliament at the end of 2001 (L.I.1692). The regulations are currently being implemented.

Integrated Water Resources Management (IWRM) in Pilot Areas: The most appropriate level of water management is at the level where all affected parties are represented. The strategy has been to secure good relationships among all stakeholders and to work in a participatory manner involving all local communities at the basin level. In order to do this the WRC is exploring ways on how to most appropriately use the decentralised government structure, specifically the Regional Co-ordinating Councils and the District Assemblies. Pilot activities are being used to test different institutional/ organisational options.

Two river basins (Densu and White Volta) have been selected as pilots to test capacity building, participation and public awareness strategies, regulations and water resources planning within a decentralized administrative framework with the river basin as the unit for planning. Results and lessons from the pilot activities have now started accruing. For instance, a consultative framework has been established for the Densu basin, sustained support is being given to awareness, and promotional activities among local stakeholders and structures have been enhanced for the collection of data and

information on the water resources situation. Furthermore, the prevailing socio-economic and demographic features have been captured and a preliminary Decision Support System (DSS) designed for decisions on water allocation has been developed for the basin. In this respect the WRIS institutions assembled the necessary data and information of technical and socio-economic nature. A water allocation model, the Water Evaluation and Planning System (WEAP), has also been applied to develop the preliminary DSS and analysis and evaluation of alternative scenarios. Similar activities have been initiated in the second pilot area within the White Volta Basin.

Public Awareness and Education Program: An essential part of Integrated Water Resources Management is the creation of public awareness for stakeholders to take advantage of and actively participate in the planning and implementation of initiatives in relation to the promotion of Integrated Water Resources Management. Education of the public, regarding the importance of water and its proper management, is also needed. A public awareness and education campaign programme with different components according to the segments of the public to be addressed has been developed and is being implemented. WRC has also finalised a comprehensive communication strategy that is to be implemented to promote the management and protection of water resources.
Drinking Water Supply and Sanitation: On the average over 60% of the population who are the low-income segments and who live in the rural, the fringes and densely populated areas of urban centres have least access to water. They pay more than ten times the official rates to vendors for water supply and end up spending more than 10% of their income on potable water.

The overall percentage of the national population of 18.4 million (2001 population figures) with access to safe drinking water supply is low. In 1992 water supply coverage for both rural and urban areas of Ghana was 28% and 76% respectively. With respect to sanitation, as of 1992, 29% of households had access to adequate excreta disposal facilities nationally. As at the end of 2001 water supply for rural communities and small town communities had increased to 41%. Coverage for urban supply had however decreased to about 70%, but represents over one million additional people having been provided with potable water and additional water production of 173,000 m^3 per day.

Capacity-Building, Education, Training and Awareness-Raising: Some key staff members of water sector institutions have been trained in specialised areas in foreign and local institutions. The WRIS project provided a platform for capacity building and training in the IWRM in the four institutions namely,WRC, WRI, HSD and MSD. Workshops have also been organised for selected district assemblies and NGOs as part of the awareness creation in IWRM. Under the GLOWA project, some training has been provided at the post-graduate level.

The Water Resources Commission (WRC) has developed and is implementing a public awareness and education campaign programme with different components according to the segments of the public to be addressed. Specifically, public awareness to promote proper use and management of water resources is being propagated through a network of major stakeholders, including district assemblies, NGOs and traditional self-help organisations. Particular emphasis is placed on the use of public participatory mechanisms, including enhancement of the role of members of disadvantaged groups, youth, farmers and local communities with a special focus on women. Policy and decision-makers and planning authorities are also being exposed to and acquainted with the principles of IWRM and how to integrate these principles in decision-making.

The public awareness raising and other educational activities as well as the various promotional initiatives undertaken thus far have highlighted the need for a communication strategy and implementation plan to guide the efforts on how most efficiently and professionally to carry forward with the ongoing interventions. Subsequently, Water Resources Commission (WRC) has elaborated on and finalised a comprehensive communication strategy to promote the management and protection of Ghana's water resources.

Information: Data and information on the country's water resources is managed by specialized institutions (Water Research Institute, Meteorological Services Department and Hydrological Services Department) and coordinated by the water Resources Commission. See also under Decision-Making. The various sectors of the economy have developed databases to help with the process of decision-making, thus the Environmental Protection Agency has compiled data on the emissions from the various industries in the countries as part of the process for formulating standards for the management of industrial activity in the country. Data is also available on the country's needs in respect of sectors dealing with forest and agricultural productivity and utilities – energy, water. The Environmental Protection Agency, through the use of the EIA, monitors the activities of all industries to ensure that they perform to the relevant laws, regulations and standards. In addition, the Agency established a Compliance Enforcement Network of relevant law enforcement and other agencies to enforce regulations, standards and laws relating to the environment. Information is only available in hard copy format from offices of the Environmental Protection Agency in all the regions of the country. The information is not available on the Internet. Though Ghana is taking part in the testing programmes for indicators for sustainable development, this is yet to extend to cover indicators related to consumption and production patterns. It is anticipated that this will be addressed before the testing programme is over.

The Environmental Protection Agency is establishing baseline data for some important parameters. It has established water and air monitoring sites in some parts of the country. The Water Research Institute is responsible for the management of water resources, water quality studies and monitoring.

Research and Technologies: The traditional fields of water research is being extended to include research in social and financial issues, integrated catchment management, policy analysis and development, decision support systems, capacity building (including education and training), ecosystem structure and function and development of new technologies and management practices. The research institutions are also focusing on interdisciplinary and participatory research that recognises the need for a link between technology and communities as well as reviewing and updating data and information on land - water resources and related socio-economic issues.

The Water Resources Assessment program of the country was considerably improved upon with the introduction of WRIS Project. The Project is supported by DANIDA.

Financing: Financial resources used thus far for Integrated Water Resources Management were obtained from external and local sources. The Government of Ghana's commitment has basically covered personnel emoluments and administrative expenses, while inflows have been very austere in respect of services and investment. This gap has however been effectively made up by the support from DANIDA sources as the main contributor to this process.

On the average, investment levels in the water sector have been about 35% of the desired. While population is growing at about 2.6% and demand for water outstripping supply, sector expansion has on the average been around 1% per annum during the last decade. The major donors in this sector, apart from DANIDA, include CIDA, DFID, GTZ, World Bank, Caisse Francaise de Development. JICA, UN HABITAT etc. In terms of financial performance, studies have indicated that it cost the country about US$0.80/ one m^3 to produce, transport and distribute potable water. Water tariffs have however been held at around US$0.20 per$bm^3$. Water supply therefore met operating costs at a level constrained by the availability of funds without regard to actual operational needs. This is evidenced by the poor state of existing infrastructure, especially the distribution systems, contributing to high levels of non-revenue water.

Trans-boundary Waters and Cooperation: Most of the initiatives that have been taken on trans-boundary issues border mainly on cooperation in the Volta basin, particularly with Burkina Faso. The following initiatives have been undertaken to date:

- A Ghana/Burkina Faso Permanent Joint Commission for Co-operation was inaugurated in Accra in 1971 for the purpose of developing on a continuous basis mutual co-operation in the political,

economic, commercial, industrial, cultural, transportation and other fields. The Commission had been dormant till it was revived in July 1998 to take up the issue of establishing a Permanent Technical Committee to study power generation, irrigation, water transport and the control of water-borne diseases especially in the Volta basin.

- By the end of 1988 UNESCO had provided assistance within the framework of the International Hydrological Programme (IHP) by initiating a process of dialogue at the technical level and promoted data exchange among the riparian countries. It took another 14 years (2002) before the IHP National Committee of Ghana organized a consultative workshop on Integrated Water Resources Management of the Volta Basin. Representatives of five out of six riparian countries of the basin attended it.
- The Environmental Protection Agency of Ghana through UNEP/GEF support got the six countries sharing the Volta basin to start preparing a Trans-boundary Diagnostic Analysis (TDA) of the basin and a Strategic Action Plan (SAP), which are to form the basis for the formulation of a GEF Project Proposal. A Steering Committee comprising the Ministers of Environment and Water Resources of the riparian countries guided the process that started in 2000. This was ready for GEF's approval in September 2002.
- The West African Technical Advisory Committee (WATAC) of the Global Water Partnership (GWP) has seized on the window of opportunity provided by the water sector reforms in Ghana and Burkina Faso and a call by the Ghana - Burkina Faso Permanent Joint Commission for co-operation to support the two countries to advance consultations and dialogue. The objective is to bring about joint management of the shared river basins for the mutual benefits of the two countries. As a first step WATAC brought together representatives of the Water Resources Commission of Ghana and the DGH of Burkina Faso in Ouagadougou in January 2002 at the technical level to work towards:
  - A draft protocol of agreement to be submitted to the two authorities for approval;
  - A priority programme of activities for two years with a budget to be carried out by the joint committee.
- Under the auspices of the West African Interim Secretariat for Integrated Water Resources Management (SISCOA-GIRE) located in Ouagadougou, Burkina Faso held a regional workshop in Accra in July 2002 recommended the establishment of a Volta Basin Technical Committee (VBTC) where all the countries will be represented. One of the main aspects of the mandate of the proposed VBTC will be to work toward the establishment of a Volta Basin Management Structure.
- Global Environmental Facility (GEF) Volta River Basin Project: Started in 1999 brought together all the six riparian countries of the basin for developing plans and actions for the integrated management of the basin. GEF PDF-A and B phases of the project have been executed with the development of a full project on "Addressing Trans-boundary Concerns in the Volta River Basin and its Downstream Coastal Area".
- From a research perspective, a number of major research activities are underway or planned for the near future. The GLOWA-Volta Project currently led by the Centre for Development Research ZEF of the University of Bonn and funded by the German Government is active in both Ghana and Burkina Faso conducting valuable studies. Two other major research activities are planned by CGIAR in the Volta basin, i.e., the Assessment of Water in Agriculture and the Challenge Programme on Water and Food.
- A 3-year Volta Water Governance Project, sponsored by the World Conservation Union (IUCN), has been designed towards improving water governance in the basin with a focus on Ghana and Burkina Faso where 85% of the basin surface is located. The three key components of the project are Decision-Support Knowledge Base; Pilot Integrated Water Resources Management interventions in a selected shared sub-basin and Policy and Institutional change. It is to start in January 2004 and end in December 2006.

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