International Journal of Theoretical and Applied Sciences **4(2):** 42-46(2012)

ISSN No. (Print) : 0975-1718
ISSN No. (Online) : 2249-3247

Integrated Water Management in the 21st Century Problems and Solutions

A Dreshaj, F Feka, I Beqiraj, A Malja, D. Topi . A Shkurti

Public University "Haxhi Zeka" Peja, Kosovo
Department of Industrial Chemistry and Environmental FSHN , UT.
E-Mail: ademdreshaj@hotmail.com

ABSTRACT: With more and more population growth increases the standard of living is also increasing demand for clean water. Municipal government responsible should be better coordinated with the region's overall water management. Sustainability of public health, protection of the environment and the economy are key to clean water. More storage of water behind dams and especially in aquifers via artificial recharge is necessary to save water at the time of excess water for use at the time of his absence. Use should be carefully planned and take measures to prevent adverse health effects in the case of groundwater contamination. Almost all of the planet's fresh liquid water occurred in groundwater, its long-term suitability as a water source is threatened by non-Point sources of pollution from agriculture and other sources that are aquifer resources depletion due to groundwater withdrawals exceeding recharge groundwater. Salty waters from drainage should then be handled in an environmentally responsible manner. Some countries can save water by importing most food, goods and electricity from other countries holding more water, so basically they also get water was needed to produce these goods. Water "virtual". Local waters can then be used for high social, ecological, or economic or saved for the future. Climate change global warming caused by carbon dioxide emissions are difficult to predict in space and time. Resulting uncertainties require flexible and integrated water management best to handle excess water, water shortages and weather extremes.

Keywords: Integrated management of water, Population, Underground water storage dams, pollution Non-Point, Sustainability.

I. INTRODUCTION

Entry. Higher standards of living will cause increased demand for better water quality, but the ever increasing wastewater flows. At the same time, more water for irrigation will be needed to meet growing demands for food for the population. Also, demand more water will be needed for the environment, such concerns will be the aquatic life, wildlife refuge, recreational values, scenic values and habitats. This will require intensive management of water resources and international cooperation. Almost all liquid fresh water on the planet earth is groundwater. Groundwater will be used more, and therefore should be protected against irrational consumption and contamination, especially from sources Point and Non-Point. Population growth and increasing water demands are uncertainty, a large uncertainty is how it will change how climates will be affected by human activities such as increasing CO_2 emissions and other greenhouse gases and other pollutants as ozone and nitrous oxide. [1] [2] . There is still no agreement among scientists as well and when the climate will change, and what changes will occur in the future. The main conclusions so far seem to be that climate change (natural and anthropogenic) is likely to be unpredictable in a local and global scale. Water resources management must be flexible in order to be able to cope with changes in water availability and demand, calls for integrated water management, where all stakeholders must be involved in the decision making process.

Historical approach requires not only the management of water supplies, but also water demand management (eg, water conservation and water transfers use and economic returns to higher quality), water quality, management, recycling and reuse Water in the economy, conflict resolution, public involvement, public health, environmental and ecological aspects, socio-cultural aspects, water storage (long-term effects of water storage or "banking").

The world's population with water supplies. The world population is about six billion is projected to double in this century. Growth will create the Third World, where there are many water utilities, ditches and other problems, about 1450 people (mostly children) die every hour due to the use of polluted water. Also, there will be migration of the population; more people from rural areas to the cities, creating many large cities, including mega-cities more than 20 million people will have increasing demand for water. Currently, there is no question that people in these mega-cities should have small gardens, to increase their food. Then it will be little difference between mega-cities with a kind of small agricultural gardens, such as densely populated rural areas. People and their pets live together where they can pose serious health problems, such as viruses and other pathogens, which normally affect the animals and can be transferred to humans [3,4]. This can cause potential epidemic of global proportions, because of lack of immunity and vaccines. Presented as Ebola virus epidemics, AIDS viruses, various outbreaks of swine flu, avian viruses. If animals are given regular doses of antibiotics to protect them from parasites develop resistance to antibiotics, pathogens, viruses can cause serious human pandemics. Adequate standard of living in Western countries and industrialized, a sufficient supply of water needed at least 2000 m^3 per person per year.

If places are available 1000-2000 m^3, the country has sufficient water, while countries with 500 m^3 of water per person per year; it is little water for residents. People desert areas possess only 1-2 m^3, which is much less per person per year (not including their pets). Almost all of the planet's water is in the oceans (97%), salt water, 3% water remains that two thirds of freshwater as snow and ice are located in mountainous and polar regions, which remains only about 1% of global water, fresh water liquid. Almost all of this more than 98% located in groundwater and less than 2% occurs in the most visible lake flows, which are often fed by groundwater. About 40% of precipitations result in groundwater for example. Mediterranean climate type is more like 10 to 20 percent. For dry climates can be as little as 1%. Natural new loading rates give an idea of safe or sustainable yield of aquifers that can be pumped from underground sources wells. In many areas of the world, especially those dried, ground water are the main sources. Adverse natural rates are difficult to predict accurately and often greatly exceeds pump refills, so that groundwater levels are falling. It is scary no matter what will happen in these areas, where wells have been exhausted and no other water sources.

Water storage by dams. Climate change in the future may include more extreme weather events, such as periods of excess atmospheric precipitation and low rainfall periods that cause drought. Also, in relatively dry climates, precipitation small changes can cause significant changes in the natural replenishment of groundwater basins. To protect against these extremes and water supply changes, is needed more water storage, including long-term storage (years to decades) need to accumulate reserves during times of water surplus, water use when their absence. Traditionally, such storage is achieved by building dams. However, the dams have a number of shortcomings, such as interference in the ecology of the river, adverse environmental effects, movement of people near the new dam reservoirs, increase other public health problems, high costs, potential structural problems, not sustainability since all dams eventually lose their capacity as they filled with sediments. For these reasons, new dams are becoming more and more difficult to build, with the exception of some countries (mostly third world). One of the advantages is that they can be operated dams in the river water flow benefit downstream, despite seasonal variations or low precipitation [1, 2, 5, 6]. On the other hand, the ease to turn the turbines. Fluctuations in electricity demand could adversely affect the ecology it can be very complex and expensive. Dams on international rivers require intensive cooperation between the countries involved, so that the countries downstream from dams are not adversely affected, site design, and operation of the dam. New dam projects require careful planning to minimize negative effects to the environment, public health, and socio-cultural effects.

Deposits of water through artificial new fill underground ferve ice. If water cannot accumulate land, should be stored in underground basins through artificial recharge of groundwater. Already, more than

98% of the world's liquid fresh water supplied from ground water. Artificial recharge achieved by water on the surface of the earth where it is filtered to the ground and moving in the direction of groundwater basins. Such systems require that they have a system like permeability soils and sandy beaches are preferred. With continuous flooding, collected particles suspended in water. Land surface precipitate and form a clay layer (clogging) that reduces filtration rates, biological, chemical, physical. Thus, the filter decreases, measures should be taken periodically as: drying, cracking, and, if necessary mechanical removal of mud layer (clogging). Against action systems can be designed and managed to increase the environmental benefits (e.g, water parks, trees and other vegetations, shelter for wildlife). Lands sandy are not always available. If aquifers are closed arteries water penetration to ferve ice must act with form "injection"wells drilling to the aquifer area. Such replenishment cost is often much higher than the cost of filtering decaying free for drilling wells basins can be expensive and the water must first be treated to remove all pending subjects, inorganic nutrients and organic carbon minimizing (clogging) in the aquifer surface. Clay (clogging) so it is difficult to remove, prevent sludge (clogging) is adequate for water treatment. More and more are built in order to recharge wells ferve ice extraction to allow recharging when water demands are low and excess water is available (eg, winter), and pumping water when demands are high in summer, the wells are used for water supplies in water treatment should be filled peak demands, but can be designed and operated to lower average demand, which is financially affordable [5-8].

The big advantage of underground storage is that there is no loss of groundwater. Groundwater recharge systems are durable, economical, and have no problems eco-environmental. Besides algae which can provide water quality problems in open waters, are underground water's edge. Underground formations act as natural filters. Such systems can also be used to clean water damaged quality.

This principle is widely used as an effective technological principle and cheap method to clean water flows from wastewater treatment plants to allow unlimited so acceptable reuse of water. The use of stored water "banking". Groundwater resources is a reliable form of water conservation and less affected by climate variants surface waters. Often, surface and underground waters or lakes are low for the amount water in dry weather conditions. Water demands have increased, there has often been a tendency to pump underground against all undesirable effects such as aquifer depletion, sinking land, salted waters, and high pumping costs, the solution is, therefore, either builds more dams to preserve the area, or to store more water underground through artificial recharge of groundwater.

Underground gatherings (Underground). Dams are not available for storing water for long periods (years to decades). Long-term storage water a collection is often called "water banking". Some of the water underground banking issues dealing with water rights, especially where surface water and groundwater are governed by different governmental systems.

When groundwater levels are high, drains should be installed to remove water from land drainage and to avoid water pollution (water logging). Emissions from drainage then contain salts and chemicals from agricultural waste, therefore, they are a source of water pollution. At the end of the final disposal of unwanted polluted water can end up in the oceans. Inland ocean spills can degrade surface water. Excessive evaporation makes the water reduction and destruction of watersheds that eventually can become environmental hazards. Final drainage water volume can only be a few percent of the original water in the water so that the salt concentrations can be 20 to 100 times higher than in the original water water. Another option is decanting water drainage, for example, reversible osmosis. saline water can then be used for drinking purposes and for other processes [7-10]. Leaving water in the ponds will eventually cause salts that crystallize, which can then be disposed of as solid waste dump. When groundwater levels are deep (often due prior to pumping groundwater) drainage water will move through groundwater and reduce its quality to the point where it becomes useless for drinking and irrigation general.

Storage of water for economic advantages. Problems salt tural and irrigation can only be stable if the salts are removed in drainage water from underground environment adequately managed for minimum environmental damage. An intriguing possibility is to use evaporation ponds as solar ponds to produce hot water for heating and electricity production. A solar pilot project was done in the basin "El Paso" Texas, is 3 m deep basin with a 1 m layer of low salinity water, on top of a layer 1 m high salinity, and a layer 1 m high salinity (with brine) Energy "Sun" is finally trapped heat in the lower layer, while the top layer of light acts to prevent thermal currents (convection) and act as insulators. Hot brine from the bottom layer is a heat exchanger ion molding where a fluid working as Freon gas is (volatile-vaporized) which then goes through a turbine to generate power. Working fluid is condensed in another (exchanger) heat that is normal water cooled which is new cycle through a cooling tower. Working fluid then returns (Exchange-exchanger) where the brine heat (preheated) from brine return flow from (exchanger) heat in the pool before it is (evaporation-vaporized). Basin "El Paso" has an area of 0.3 ha and generates 60 to 70 kW. At this rate, if the basin is of about 5.000 ha can generate about 1000 megawatts of electricity, which is a typical size of a power plant. Heating is not enough energy stored in hot brine layer to generate power at night. Following irrigation, membrane filtration, and solar ponds for power generation have the advantage that they treat the brine water energy production income. Discharges from wastewater chemicals, pharmaceuticals, hospitals and other medical facilities, free medicines used violence, and human excrement containing medications metabolized. Chemicals pharmaceutical active include industrial chemicals, such as pesticides, dioxins and chlorinated organic compositions. While direct toxic or carcinogenic, these chemicals can produce adverse health effects directly intervene in the production of endocrine hormones), weaken the immune system. So far, the active chemicals pharmaceutical studies were conducted in aquatic animals, with side effects in the production of hormones and reproductive processes are observed feminization of men. Are observed long-term effects of chemicals and pharmaceuticals and related chemicals should be removed from the water environment as much as possible their farm animals with the ingestion of hormones, antibiotics and veterinary medicines, can also be a source of drugs in water and wastewater from animal feeding operations are spread on the ground [5, 11,14].

Biodegradation of organic substances and erosion. Others that are potential pollutants in drainage water from sewage waters crops and plants are substances humic and acids flulike. Humic substances are formed as stable products anywhere from bio degradation organic substances. Water come from nutrient flows with chemical substance can be expected to produce lush vegetation when used for irrigation, biomass is more and the earth which biodegradation can produce increased levels of raw humic in drainage waters and, ultimately, completed the underlying groundwater.

Erosion control practices, as well as organic and inorganic nutrients and pesticides in runoff water. (Strips vegetated buffer), the effects of increasing the concentration of CO_2 and other greenhouse gases in the atmosphere entails rising temperatures and climate change. Forecasts range from the more severe effects on ecosystems and our health. Increased flooding, drought. Sometimes it seems that the conclusions are based primarily on consensus and majority opinion of all this controversy shows, however, that it is not known to a sufficient degree of accuracy what will happen in space and time in the future. Thus, it is difficult to make adequate plans. In addition to gradual changes, long-term climate change. Changes within the space of a human generation can occur. Global precipitation forecast models are based on models for forecasting global temperatures in response to increasing CO_2 concentration in the atmosphere. However, the prospects for increasing temperatures are fraught with uncertainty (Kimball), which makes atmospheric precipitation forecast. However, because the temperatures are projected to increase globally averaged evaporation from the oceans will increase average global precipitation. Precipitation patterns may vary. As a result, the increase in mean precipitation is likely to lead to increased rainfall variability.

It is not surprising that some countries, especially those small package geographic diversity and hydrology, these countries are concerned about the management of water resources in the future and are trying to make some predictions as to what may happen to these countries in term time. These countries include the Netherlands, which is concerned about increased flooding caused because large peak flows and increasing sea water level [1, 5, 9].

Dutch and Israeli modeling climate change. Are based on the estimated average temperature rising (4°C 2100), from which they estimate precipitation increases (4% in summer and in winter 25%) which then go into their model for predicting hydrological flows flooding. These predictions are useful for long-range planning and show that for the next 20 years, flood control dikes would still be feasible. As time income, climate and climate science will further develop in the most detailed and reliable climate scenarios can be formulated. Sea level rise by 2100 are projected to be in the range of 20 to 110 cm. Tests such as these are useful for planning long string to other river basins. If indeed increased flood flows may ultimately be feasible the construction of flood ways parallels can be good normally, these ways of flooding will form and there will be no expensive structure, Uses for flood control: made a forestation " green" done in rivers, has minimal damage. Green River concept can also be applied to small streams. In the canyon of Los Angelo sit small floods occur every few years, and major floods covering most of the river about every 20 years. In the 100-year-old flood is the amount of water flows into the canyon $850m^3$ / s. Flood data so far is 570 m^3 / s, which occurred in 1972 and has a recurrence interval of 70 years. Floods have short life for a few days to about a week, and will cause damage. Israel has also made predictions on future climate change scenarios based on changes in local climatic trends and national research and regional climatic patterns. Projected changes for

2100 are: mean temperature increase 1.6-1.8°C, decrease in precipitation 4-8%, increasing to 10 percent (vapor transpiration); late winter rains; increase the intensity of rain and cuts season rain; great seasonal variability, the temperature increased, the severity of extreme climate events, and great uncertainty spatial and temporal climate [9,10,11,12].

Because of uncertainties in predictions of global change, particularly in space and time, the best policy for water is water resource management in order to be able to handle the flood good management in times of drought to surpluses and shortages water. This is best achieved through integrated water management, as previously defined. Global change may also affect the emergence of infectious diseases.

Additional carbon circulation modeling outdoor. Scenario specific modeling overall carbon flow used for the design provisions for increased evaporation. Be made that a forecast will grow globally parameters, temperature and CO_2. Modular changes are very uncertain. Direct effects of raised CO_2 (expected to reach up to 950 - 540 µmol mo1^{-1}, depending on CO_2 emissions. Scenario plant flora cause stomata resistance increase by about 20-40%, for a 350 µmol mol^{-1} increase in CO_2. At the same time, increasing CO_2 will stimulate growth in the sheet plant area (perhaps on the order of 10% in the peak foliage index for a 350 µmol mol^{-1} increase in CO_2 concentration for C_3 plants C_4 plants respond). Predictions of climate change and direct physiological effects of raised CO_2 in plants likely will cause shifts optimal for crop production regions. Further, the human economy and social factors will also cause changes in land use and associated irrigation water requirements. In addition, most likely there will be changes in the natural vegetation in the upstream catchment, which can alter the supply of water available for irrigation in the future. In conclusion, climate change is likely to affect future water and its sources. Yeah concentrations of other gases in the atmosphere can also be increased. Some of these may have negative effects. For example, ozone levels have been weakened in the last 100 years and are projected to continue growing at the fastest rate in the future additional gases. In an experiment conducted an increase in potato induced by CO_2 form the air. Carbon emissions can be reduced by storing and using energy efficient, using non-fossil energy sources (hydropower, wind, solar, nuclear, and ethanol or other non-fuel) and growing more plants for carbon sequestration in biomass and soil. Befouled still emit carbon into the atmosphere but, unlike carbon from fossil fuels, carbon recycling is done through the process of photosynthesis. This requires international cooperation to achieve the Kyoto agreement in 1997 obtained have regarding delegates from 165 countries agreed to limit carbon emissions or cut them below 1990 levels [1,9].

Kosovo's water resources and reuse. Water reuse planning is becoming increasingly important for two reasons. One is that the discharge of wastewater into surface waters is becoming increasingly difficult and expensive cleaning. Requirements more stringent treatment to protect receiving water quality for aquatic life, recreation and benefit downstream users. The second reason is that municipal wastewater is often an important water resource that can be used for a number of purposes, particularly in areas with scarce water. Reuse is required (non-drinking) for purposes such as agricultural irrigation and urban use, industrial use (Cooling), growth environment (wetlands, wildlife refuges, habitat), fire fighting, dust control, and to wash toilets. This requires treatment so that it meets the quality requirements intentional use. To invest in adequate infrastructure such as storage reservoirs, canals, pipelines and dual distribution systems are needed so that the waters of different qualities can be transported to different destinations [6, 9].
Are important aspects of water reuse, especially where the public is directly affected? Processes for unrestricted reuse reatment plant (non-drinking) primary and secondary treatment followed by tertiary treatment consisting of, flocculation, sand filtration and disinfection (chlorine or ultraviolet radiation) to ensure that it is free flow water from pathogens (viruses, bacteria and parasites). Can then be used for agricultural irrigation, urban parks irrigation, fire fighting, washing toilets, industrial uses, as well as other purposes tertiary treatment is relatively high-tech and expensive and is feasible.

World health organization recommendations for water treatment. World Health Organization has developed guidelines that are based on documented disease epidemiological analysis. Epidemiological studies have shown that the use water treated with chemicals for crop irrigation use cleaner greatly reduces health risks compared with untreated sewage .. Wastewater treatment for direct potable reuse requires advanced processes that include nitrogen and phosphorus removal (nitrification / gentrification and lime precipitation), the removal of organic carbon compositions enabled (carbon adsorbed), removing inorganic compositions and pathogens The filtration process (micro-filtration and reverse osmosis), and disinfection. Even when all these treatment steps are used and the water meets all drinking water standards.

Virtual Water. Imported goods that take a lot of water to produce food and energy, from other countries that have abundant water resources. Areas receive water that was necessary for processing goods. This water is "virtually" embedded in the mall, it is called virtual water. For example, for every kg of wheat imported from one country to another also takes a m3 of virtual water cost much less than the value of local water resources. Use more water, just to satisfy the people, the pride of being sufficient in food production (particularly raw foods) will not be economic then if these foods can be imported much cheaper from water-rich countries. Many world areas will face serious water shortages, less likely to have adequate water for their residents, even trying to collect more water for people
International cooperation can then be created to develop eco-tourism in these areas that will provide income for the importation of food and virtual water main. Virtual water then it will be much cheaper than using the water itself.. Proposals Varo by building large pipelines or water in transporting water in tankers and towed iceberg polar regions, or large rafts of fresh water. Countries, such exports water can be a significant source of revenue.

CONCLUSIONS

(i) Population growth and climate change will pose secure heavy demands on water resources in the future.
(ii) Principles of integrated water management and international cooperation will be needed to develop sustainable systems and prevent ecological disasters farming.
(iii) Good management of water should be integrated to other clean water.
(iv) Management practices, from the actions of a user group will affect water interests of others.
(v) More research needs to be done to ensure the setting of the water.
(vi) Resources to be based on scientific facts and engineers regions local, national, and international efforts, cooperation, and costs are needed to meet future food and water.
(vii) Demand stable, peaceful, and environmentally responsible way.

or other goods may then economically and politically to be a very good solution, and probably the easiest way to achieve peaceful resolution of water conflicts. Economy and trade becomes increasingly global, global food movement's actions field. To ensure that the global distribution of food will not be used as a political weapon, it should be controlled internationally representing importing countries. Other options for saving local water resources by importing virtual water include electricity imports from areas with more water for cooling power plants, dams for hydro-electric power generation, or coastal areas that provide ocean water for cooling. Virtual water concept may also be useful in international ecological importance wetland protection against water diversions.

REFERENCES

[1] De Olivier A, C.R., Lombardi, A.T. & Jar dim W.F.. Copper compexation by naturally occurring organic meter: A multiligand model. *Chem. Spec. Bloavail,* 7, 125. (1995).
[2] Smith, R. M. & Martell, A.E., Critical stability constants. Plenum Pres, Neë York. (1981).
[3] Herning , J. G. & Morel, F. M. M. Kinetcs of trace metal Complexation: role of alkaline- earth metals. *Environm. Sci Technol.*, **22**,1469. (1988).
[4] Knoch, W. Wasserversorgung, Abwasserreningung und abfallentsorgung, VCH, Weinhaim, New York, 557. (1994).
[5] Çullaj Allqi,Metodat instrumentale të analizës kimike. Shtëpia botuese e librit universitar Tiranë.(232-237). (2004).
[6] Thomas,R.Beginner's guide to ICP-MS.PartsI-XI.URL :http:/www.spectroscopymag.com/.
[7] Korça Bardha, Analiza kimike e ujit, Donacioni i MASHTK & Östrich, Prishtinë, 71-121. (2003).
[8] Petz, B. Osnovne statistićka metode za nematematićare, IV izdanje Naklada slap, Zagrep, 63. (2002).
[9] Dreshaj Adem Punim Masteri 2009 Karakterizimi fiziko–kimik i ujit Drin i Bardhe
[10] A.H. Weerts, Analytical models for chemical transport on the subsurface environment,Wageningen Agricultural University, Department of Water Resources, Wageningen, The Netherlands, 1994.
[11] B.S. Mathur. The pollution of water resources due to rural industrial waste, Chemistry and Chemical Engineering Department of the Indian Institute of Technology, Delhi, India, 2005.
[12] .B.G.Skakalsky, Study of anthropogenic influence on water quality in some rivers of the Baltic Sea Basin, State Hydrological Institute, 2nd line, 199053, Leningrad, U.S.S.R, 1981.
[13] BMZ ed.,: Environmental Handbook: documentation on monitoring and evaluation impacts (Vol.I-III). Vie`weg, Leverkusen 1995
[14] Bratli L.J: Classification of the Environmental Quality of Freshwater in Norway: Hydrologicaland limnological aspects of lake monitoring. Heinonen et al. John Willey &Sons Ltd.2000
[15] Brebbia, C.A.Skerget, P. (1984), "Diffusion-convection problems using boundary elements", in Laible, J.P., Brebbia, C.A., Gray, W., Pinder, G. (Eds),Finite Elements in Water Resources V, Springer-Verlag, Berlin, pp.74768.
[16] C.P. Kumar, Groundwater flow models, Scientist 'E1', National Institute of Hydrology, Roorkee – 247667 (Uttaranchal), 2003.