SCIENCE AS A SUBJECT OF LEARNING IN ISLAMIC UNIVERSITY

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ABSTRACT
This paper aims to searching theological impact when applied a science as a subject of learning at Agrotechnology Department in the Faculty of Sciences and Technology of State Islamic University of Bandung. The atmospheric experiment was implemented as a subject of learning. By observing the atmospheric data recorded, the plant growth measured significantly affected by the implementation of treatments, the best water supply and fertilizer application. Furthermore, it found that local climate has changed, and Schmidt and Ferguson classification of regional rain types is no more valid, thus, should be renewed. The experiment impacted to a science learning program in Islamic University. Climatic change is a natural law affected by human destructed to the nature. It has been affecting farmers to maintain for their plantation activities. When organisms were effort to surviving in warmer and unpredictable condition, that is shows to human kind has to obligatory to the Almighty God.

Keywords: Science, Climate change, Islamic university.

ABSTRAK
Tulisan ini bermaksud mencari dampak teologis saat menerapkan sains sebagai mata kuliah di Jurusan Agroteknologi Fakultas Sains dan Teknologi Universitas Islam Negeri Bandung. Percobaan tentang atmosfer kemudian dilaksanakan sebagai mata kuliah. Dengan mengamati data atmosfer yang direkam, pertumbuhan tanaman yang diukur secara signifikan dipengaruhi oleh pelaksanaan perawatan, pasokan air terbaik dan pemupukan. Selain itu, ditemukan bahwa iklim setempat telah berubah. Klasifikasi Schmidt dan Ferguson tentang jenis hujan daerah pun tidak terlalu valid, sehingga harus diperbaharui. Percobaan pun berdampak pada program pembelajaran sains di Universitas Islam. Perubahan iklim menyebabkan petani harus memelihara iklim agar menunjang kegiatan pengelolaan perkebunan mereka. Organisme yang berupaya mempertahankan hidup pada iklim yang hangat dan tak terduga, menunjukkan bahwa manusia pun wajib berbakti kepada Allah swt.

Kata Kunci: Sains, Perubahan iklim, Universitas Islam

INTRODUCTION

Indonesian National Education goals as quoted by Beck and Irawan (2014, p. 2) are: 1) to form human who has belief, cautious, and noble characters; 2) to master science and technology; and 3) to actively participate in creating order and peace in the world. Those goals are difficult because the development of national regional even international require people have such capabilities and characters. In relation to the issues of global warming and climate change, it is required persons who are capable and have a comprehensive knowledge of spiritual, social, educational, and technical in order to deal with unpredictable environment. Here, the authors aimto discuss the goal of mastering science and technology as the goal of national education in reference to biological plant agronomy.

The world acknowledges that middle centuries were the Muslim Golden Ages. During these centuries Muslim scholars had laid foundation of the development of science and technology. The *Dār al-Hukamā* (House of Wisdom) founded by Ma'mun in 830 at Bagdad was the first institution of higher learning in the Islamic world. Beside, a translation bureau was built.This institution functioned as an academy and house an up-to-date library as well as an observatory and as a teaching center in various branches of science (Meta Existence, 2014)

Science and technology existed within the core curriculum of education, and the Sultan or the Caliph gave high appreciation to scholars who wrote their finding/taughtin a book and gave prize to them in which the prize was gold as much as the weight of the book. Islamic Scientific Education at that era produced the well known Muslim scientists as Ibn Haytham, Averouse, Avicenna and others. Meanwhile, Muslim world (Baghdad, Kuffah, Cordova) became the destination of students around the world. Ibn Haytham was famous as the father scientific methodology.e conducted experiments in technologies and wrote his findings in the Book of Optics (Wikipedia, 2014). In that era Islamic education included the natural and life sciences.

Biological plant agronomists in the climate change and global warming situation have to reset and adapt their standard of practical procedure in applying their knowledge in the field. The schedule of activities in the field work has to be flexible, to be easily adapted, and to the unpredictable climate. The means and materials needed for a certain production have to be re-arranged and re-calculated their costs (cost of water irrigation and fertilizer). Man power recruitment should also be rescheduled. All of these changes do not haveto be regretted as erratic and anomalous ways of nature. Instead, educated people should consider it as a challenge and study, because global warming and climate change emerge due to the consequences of dynamic

life. People who areirresponsible individually or collectivelyburn the forest, over exploitation of coal/oil/tin/silver/goal/steal, mining, illegal logging, and other destructive activities. They have beenhaving and are changing this world toward warmer stages. Social, humanity (religious) and technology approaches are required. All aspects of knowledge and approach are needed to educate people. To deal with this problem education appeared as solution. To make people cautious and feel concern with global warming, and aware that illegal logging is wrong deeds and are destructive, educators have to create new approach and new content of educational syllabic or curricula adapting the need of environment.

Education of all aspects of life and skills as stated by Nasr (1990) quoted by Beck and Irawan (2014, p/21) is that Indonesian Islamic education has to concern with the whole being of men and women who seek and educate themselves. Its goals are not only the training of mind but that of the whole being of a person. That is why it implies not only on instruction or transmission of knowledge (*ta'līm*), but also on training of the whole being of a student (*tarbiyyah*). Moreover, A teacher was not only a *mua'llim*, a transmitter of knowledge, but also a *murabby*, a trainer of soul and personalities.

However illegal logging, forest burning, and over exploitation of natural resources are conducted by skillful and educated people, but they are greedy and irresponsible people. Their knowledge, sciences and skills are functioned to be destructive deeds. To create educated peoplewho haveconcernwith community life, Al-Faruqi (1984, p. xi) has stated that to reset the wrong manner of knowledge and educated people who have made this world injustice, miss management, and destructive, Muslims have to unite themselves in historical views. Based on this united history, all disciplines of knowledge should accommodate the common grounds and devote themselves to achieve the common goals. All disciplines have in common human characteristics.

The whole being of an individual involves all spiritual, knowledge, and know-how or skills. Biological agronomic are skills of applying biology theories in practice. Education and training of mastering skills in biological agronomy, specific to managing the climate change, should be based on research finding. When people reveal something in their research, they must not be a pride of personality, because the finding is not real something new in realm. What they do is just to reveal or re-finda hidden thing. The Almighty God educate people toacknowledge praise to Allah and be more *Tauhīd*. Al-Faruqi (1984, p. xii) said the ultimate Islamization of Knowledge is to make people become more *Tauhīd*.

Now scientists agree that the climate change has been progressing much faster than in the past. Nasa (2013) reports that certain facts about earth's climate are not in dispute; The scientists also show that in the past, large changes in climate have existed very quickly, geological-speaking: in tens of years, not in millions or even thousands. In addition, scientific evidence is clear: global climate change caused by human activities is occurring now, and it is a growing threat to society.

In the Holy Qur'an, chapter ar-Rūm, verse 41, it recites"Evil (sins and disobedience to Allah) has appeared on land and at sea because of what the hands of men have earned (by oppression and evil deeds), that He (Allah) may make them taste a part of what which they have done, in order that they may return (by repenting to Allah, and begging His pardon) (Al-Hilali and Muhsin Khan 1404 H)

The evil deeds done by some people who are human are people who have not get wise consideration in their effort to meet their own needs. Illegal logging, forest burning, uncontrolled extraction of natural resources, all are done by greedy people. They cause disrupted hydrologic cycle firstly, and then disturb natural balance. The balance of nature maintains the cycle of water, and water are stabilizing agent of the global temperature.

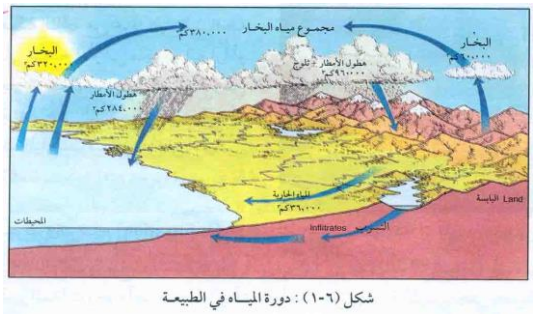


Figure 1. Water Cycle in the Nature (Abdel wahab, 2014)

The task of wise people to make as good as possible every practice reasonably is to handle and manage the negative effects of destructing nature. Climate change as the result of the evil deeds must be considered as challenge from the Almighty God for wise men to search and keep studying the universe and explore ways of how to grow plant in the climate change condition. So the harvest can be obtained for the survival of people.

Figure 2. Water Cycle with Expressions from al-Qur'an

Anyway, people have to obtain harvest of plant if they want to survive in their life. So, conducting series of experiments to handle and manage the changing characteristics of climate become necessaryto the believers. It is a kind of devotion to Allah because the result of the experiment provide benefit to the human kind. Thus, climate change becomes a rich object of education for human being. Then, the question arises how the method and procedure is, to conduct such experiments. Our prophet Muhammad PBUH said: "*Antum a'lamu bi umūri dunyākum"* which means thatyou have more capabilities in your profession". There is no detailed and specific guidance in the Qur'an to observe the universe. Allah has blessed and equipped people with t intellectual, and He encourages us to explore universe even to go pass beyond the zones of heavens (outer space) and the earth (QS. Ar-Rahmān, [55]: 33). In this respect, the authors wish to report their findings in related tothe phenomena of the effect of earth dynamic, that is the scares of water (water stress) affecting the production of ramie plant. Fabre of ramie is material for human clothes.

Water is prerequisite of agriculture activities, but farmer may not stop action due to lack of water, farmers have to produce something for feeding or meeting the needs of people even in harsh and hardship. The saying (*Hadith*) of Prophet narrated by Imam Ahmad, "If dooms day will occur, while in the hands of one of you there is a seed of a date-palm, then when he is able to plant before the doomsday, he should plant it."

Agriculture and fisheries are highly dependent on specific climate conditions. Trying to understand the overall effect of climate change can be difficult (Maponya and Mpandeli, 2012). Global climatic change has been influencing all aspects of agricultural activities. Huang,et al. (2013) reported that it might be due to rainfall pattern shift as a result of global climate

change, causing worse drought coming along with high temperature in Yangtze river basin.

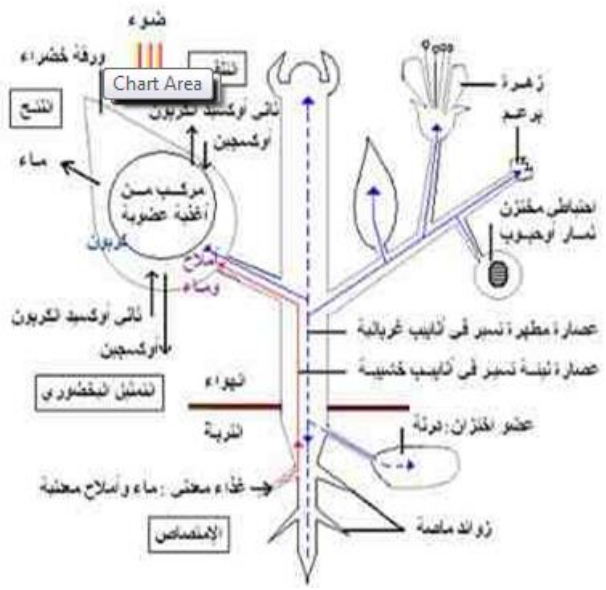


Figure. 3 Climate Phenomenon

This climate phenomenon cannot be easily detected or explained by only the average data of annual precipitation, but must be by all factors of climate. Such condition is experienced by farmers in Indonesia (in the tropical climate region). The farmers find difficult to make their cultivation plans. There is no more distinction of dry and rainy season as it was used to be, change of environmental conditional agroclimatic throughout the months of the year has occurred.

Dube, et.al (2013) defined climate change refers to any significant change in the measures of climate lasting for an extended period of time. Climate change includes major change in temperature, precipitation, or wind pattern, among other effects, that occur over several decades or longer. Nasa (2013) reported that the earth has warmed since 1880. Most of this warming has occurred since 1981 and with warmest years occurred in the past 12 years Even though the 2000s witnessed a solar output decline resulting in an unusually deep solar minimum in 2007-2009. That occurrence effects photosynthesis process as denoted in Adams.et.al. (1998), Maponya and Mpandeli (2012) who said changes in climate and the atmosphere are inevitable for the coming decades, raises concerns regarding the adaptive ability and the likely responses of the agricultural sector. Iqbal, et.al. (2009),

Zhang and McCarl (2013) said there is a growing research interest on trans-disciplinary measurement of vulnerability to climatic hazard of climatic change. Anomalous in respiration and transpiration that plant metabolism is disrupted.

This global and local knowledge and special local condition encourage agronomist and local agricultural policy makers to share their analyses and assessment to formulate appropriate and likely agronomy action to avoid climatic hazards. Traditionally, in Indonesia rainy season come in September, and the month of March is the beginning of the dry season. That regularity enables farmers to make a definitive plan for their lands. However, now the regularity has been extinct due to the regional climatic change. Some of environmental sensitive plants are considerably affected. One of them is Ramie which is sensitive to water supply. Ramie grows and is harvested every 60 days. Ramie needs humid soil but not saturated for well growth, but ramie is cultivated in un-irrigated land. Unlike the dry-land sugarcane cultivation practice which is supplied with additional irrigation water in time of rainfall is lack within certain period. Bordoloi, et.al (2006) scheduled the harvest of ramie less than 60 day after the previous harvest.

Figure 4. Nitrogen Cycle

Ditjenbun (1997) stated that ramie is best grown in area of A or B rainfall type regions where the crop can be 5 to 6 harvests. Ramie is still commercially feasible in C rainfall type region with addition water supply in months of the end of rainy season, and region of D rainfall type is not suitable for ramie cultivation. RIFT (1997) noted annual rainfall of 1500 to 3000 mm and evenly distributed through the year considered good. Rainfall type regions were classified based on Schmidt and Ferguson (1951). Ramie is one of the major foreign exchange earning crops in China due to the high

quality textile of its fine fiber. However, seasonal drought has been becoming a major limiting factor for fiber yield, especially under global climate change (Huang, et.al. 2013). Santoso (1996) said ramie plant susceptible to water supply, it will stagnant in the peak or end of dry-season in tropical climate.

Ramie plant grows well in humid and warm tropical region, subtropical and temperate zones. And, in the winter temperature it does not drop below frozen level (Zhiping, 1989). Dempsey (1963) said the optimum temperature for ramie plant in sub-tropic region ranged between 20 ^{0}C and 24 ^{0}C, and in tropical region 24 ^{0}C and 28 ^{0}C. Tiangchan and Ling (1989) said the optimum temperature for rami between 23.0 ^{0}C and 29.7 ^{0}C, minimum temperature 9.0^{0}C.

Bordoloi, et.al. (2006) stated that ramie plant resists well in the winter low temperature, such as the minimum temperature below 9. 0^0 C thanks to the protection offered to rootstocks by a layer of dead leaves. Petruszka (1977) said in the tropical regions, a good yield harvested in plantation at the elevation 1300 m above sea level, and rainfall ranging from 140 mm to 360 per month with even distribution through the months and the year.

Biophysical environmental condition includes elevation, climatic regime especially the rainfall, physiographical, soil condition and drainage affect the pattern of physiological growth. Ramie plant harvested within 2 or 3 months, considerable biomass are harvested and removed out of the land. This causes the enormous removal of nutrients. Chuntao et.al. (1989) said applying fertilizers is a must to maintain land productivity. Nitrogen is important for vegetative growth, but given effects to quantitative of fibre. Zhaode, et.al (1989) said phosphorus is not so important for ramie, while potassium affects quality and quantity of fiber. Potassium is considered as the second most important nutrients for ramie plant. Qiang, et.al (1989) said potash gives good effect on yield quality, it can counter the negative effect of nitrogen. It is aimed to provide benefit for ramie planters and encaurage people to think the need to pay more attention to addressing the warmer atmosphere. Ramie is perenial plant when it is grown in slope topography. It can avoid erosion and minimize the destructive run-off. By product of the plant it is beneficial for livestock feed. The main product is the china-grass which is worth and potential to substitute cotton that must be imported. This means to saving the foreign exchange. A person is part of this universe, the elements of whom are complementary to one another in an integrated whole indeed. He/she is a distinct part of the universe and has a special position among its other parts.

Site, Materials, and Methods

Bandung regency belongs to C rainfall type, 5 to 6 wet-months and 2 to 4 dry months (slightly wet) based on Schmidt and Ferguson (1951). Polybags were filled with Soil ordo Inceptisol, sub ordotropeptl and sub group Fluventik, Eutropepts, isohipertermik. The experiment took place from August 2014-October 2014. Rhizomes cutting were of 8 cm long and selected morphologically homogeneous. Meteorological condition data were recorded during the experiment.

The experiment was laid out in a randomized block design with two replicates. Plot was polybags size 40 cm x 30 cm consisting of four polybags in each plot. Water supply treatments consisting of 8 levels of dosages, they are: w1=15% -20%; w2= 25% -30%; w3 = 35% -40%; w4 = 45% -50%; w5 = 55% -60%; w6 = 65% -70%; w7 = 75% -80%; and w8 = 85% -90%. Nitrogen+Potassium dosages were 3 levels: f1 = 15 kg+15 kg/ha; f2 = 30 kg+30 kg/ha, and f3 = 45 kg+45 kg/ha. There are 24 treatment combinations, it means they are 48 plots.

Indorami 1 (formerly Pujon 10) cultivar was the selected cultivar. Rhizome cutting of 8 cm length were selected based on morphological appearances and planted in polybag. Nitrogen of Urea and potassium of ZK dosages for each plot and polybag were determined based on the dosage per ha, and applied at the first day of experimental treatments (15 days after planting).

The poly bag was filled with 20 kg top soil of the local soil having homogenous texture and structure. There are perforations (holes) around the polybag allowing the excess water supply to seep out up to the 15 days after planting (DAP). In the 15 DAP was determined the dosages of water supply by practical method of measuring field capacity status. The sample polybags were tested for water holding capacity by oven-drying method. The sample poly bags were irrigated till saturated and 48 hours later the soil sample were taken from the middle of poly bag. The supply of water dosages were determined by counting percentage of the field capacity. After being found the dosages of water for each treatments, the holes around the polybag were sealed with isolative plastic. Water treatments were supplied every day in the evening up to harvest time.

Response variables measurement: Physiological (Leaf chlorophyll contents; Leaf relative Water content),Growth and Yield (Number of stem; Length of stem; Diameter of steam; Weight of stem; Crude fibre weight; Fine fiber weight; Fine fiber diameter). The leaf relative water content (LRWC) was measured by weighing the fresh weight (FW). The leaf samples were immersed into the distilled water as long as 12 hours for turgid weight (TW). So leaf relative water content was calculated as LRWC = (FW-DW)/(TW-

DW) x100. Determination of LRWC was done in 45 days, 60 days and 75 day after planting.

Measurement of chlorophyll content of leaves is to dissolve into ethanol (10 ml) for weighing 1 gram of leaves (mature: leaves of the 8th or the 9th from the top bud are selected). Crushed leaves in a cup with 10 ml of ethanol. After dissolved then it is measured on a spectrophotometer Optima SP-300 specification. Figures recorded in spectrophotometer then match with the Arnon (1949) in Subandi (2002) formula as: Chlorophyll a = 12.7 λ 663 – 2.69 λ645; Chlorophyll b = 22.9 λ 645 – 4.68λ633; Chlorophyll total = 20.2 λ 645 +8.02 λ645 (mg/L).

Measurement of Stem Diameter, stem weight, plant height, weight of crude fiber, fine fiber weight, fine fiber diameter done at harvest or 75 days after planted. measuring the weight determined with analytical scales, while determining the fineness of fiber or diameter of fine grass is using a microscope equipped with a filter attached Optilab Upgrade edition at binocular microscope Olympus CX-21 and operated by the operating system window (7) Stem Diameter.

Stem diameter was measured with a shape meter at the point about 10 cm above the ground. Stem length is measured from the base of the stem near the ground until the end of the stem near the top. Measurements with tape meter conducted repeated 3 times. The stems that grow out of the cutting were calculated, the stem grew later out of the first adult stem were excluded. Weight of stemis measured with cutting stems manually from the base of the stem. Discarded leaves along the stem. Weighing is done with analytical balance. Crude fiber is obtained through a process of decortication (decortecator), because relatively small amount of stem decortication is done manually. Fine fibers are coarse fibers that have been through the process of degumming.

Crude fiber fed into an exhaust dye tinovetin containing 25 ml of solution per gram of fiber. Dye gelatin liquid is heated at 85^0 C, the heat for one hour. Fiber removed and rinsed with NaOH solution of 38 Be. Single fibre is prepared out of the fine fibre. The measurement with the binocular microscope equipped with Optilab.

Data obtained were analyzed with Analysis of Variance/or Anova, and mean variance test was with Duncan Multiple Range Test/DMRT, significant difference at 0.05 probability level. This article is search to related the climate phenomena to Islamic education. This items which are made on contents based solution grounded from the verses of the Holy Qur'an or the Hadith of Prophet Muhammad PBUH. The relation between man and the universe, as defined and clarified in the Glorious Quran and the Prophetic teachings, as follows: A relationship of meditation, consideration, and contemplation of

the universe and what it contains; a relationship of sustainable utilization, development, and employment for man's benefit and for the fulfillment of his interests; a relationship of care and nurture for man's good works are not limited to the benefit of the human species, but rather extend to the benefit of all created beings; and "there is a reward in doing good to every living thing" *Sahīh Al-Bukhāri* quoted by Ismail (2007). Thinking constructive, productive, and educative on how to manage nature is kind of devotion to the Almighty God. Mastering technology of adapting to unpredictable climate needs new knowledge and may be deriving a new science. This will consequently to the creation or adaptation the content of curriculum to the need of special competence.

FINDINGS AND ANALYSIS

Daily (day) temperatures recorded at the experimental location in the month of August, September and October are presented in Figure 5. The figure shows that temperature was high enough. The average in August was 30.16^0C, in September decreased to 29.38^0 C and in October the temperature lower to the average 29^0C. It means that the temperature in August was higher than the optimum required for good growth of ramie, Chang and Ling (1989) stated that the optimum temperature is 23.0^0C – 29.7^0C and the minimum is 9.0^0C.

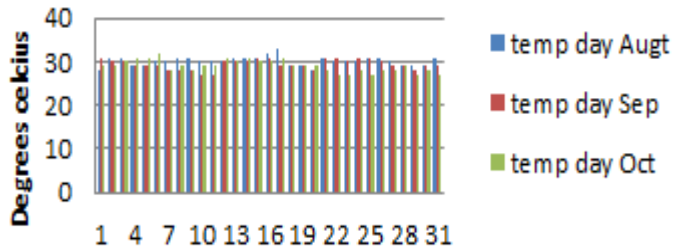


Figure 5. Air Temperatur

Figure 5 shows the solar radiation at the average contributed to the high up of temperatures. Temperature up to certain degrees will enhance rate of photosynthesis and rate of transpiration. And too high rate of transpiration may dehydrated plant. Water removal of the tissue have to be replenished by water intake at the root points otherwise the plant will gradually wilt permanently. This condition is not favourable for rami cultivation.

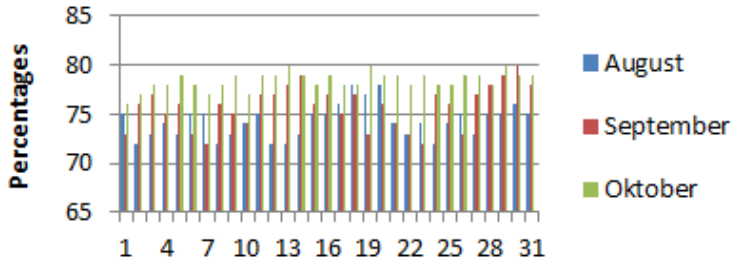


Figure 6. Air Relative Humidity at Day

Relative humidity at the site of experiment was recorded in August at the average 74.29%, in September 75.77%, and in October where in this month somewhere in this region were raining causing the air humidity increased to be 78.45 %. However, these percentages were still lower than the good humidity for ramie plant growth. It was moderate low for the optimum, growth of ramie plant. Budi Santoso (1996) found relative humidity for good growth is 80%, and below 21% detrimental to plant. Record during the months indicated that the global climatic change is affecting the local climate.

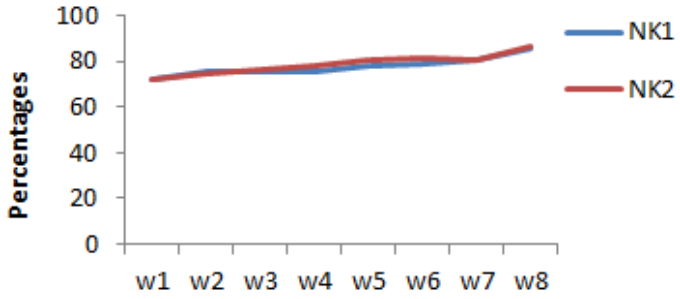


Figure 7. Relative Water Content

Formerly, in this region in the months under the name with the suffix *ber* as the September, the October, and so on, the rainy season began. However, the current empirical records says in September and October there still underwent dry season condition. This empirical fact shows there has been a shift regional dry to rainy season. And, this orderweas the based for Schmidt and Ferguson (1951) made the classification of regions on rainfall types. For decades Schmidt and Ferguson classification used by students of agriculture or biology departments, but now it has changed. The classification is no more accurate and valid as the influence of global warming. Scholars

have to make another or new classification. Leaf Relative Water Content (LRWC) is measured yielding data and then analyzed. It showed the effect of water and fertilizer treatments on relative water content of plant as differ significantly. The more water and fertilizer applied the more LRWC. Figure 7 shows the effect of water dosages at levels of fertilizers as different. Plant water status as response to the water and fertilizer. Plant absorbs nutrition (nitrogen and potassium) in the presence of water as solvent. Huang et. al. (2013) stated LRWC representing the plant water status, reflecting the metabolic activity in tissue. Sartaj et. al. (2013) said LRWC is usually used as one of the most meaningful indexes for dehydration tolerance in wide variety of plant. In the first ramie plant generation the effect of fewer water supplies does not cause problems in plant metabolism. The cutting as source of growing energy still supplied sufficiently germination and further first growth. But, it is apparent that the trend is becoming different in dosages of water and fertilizer that will result in different response of ramie plant. It is also apparent in the extrapolation of the curves in the Figure 7. There will be a stiff rise of the effect of more water and more fertilizer. The QS, Al-Anbiyā, [21]: 30 stated that all living organism are prepared from water (Subandi & Humanisa, 2011, 31).

In addition to this vital function, water has another socio-religious function to perform which is the purification of the body and clothing from all dirt, impurities and defilement so that a person may encounter God cleanliness and purity. God has said in the Glorious Quran: al-Anfāl, [8]:11, "And He caused rain to descend on you from heaven to cleanse you therewith…" (Al-Hilali & Muhsin Khan, 1404 H).

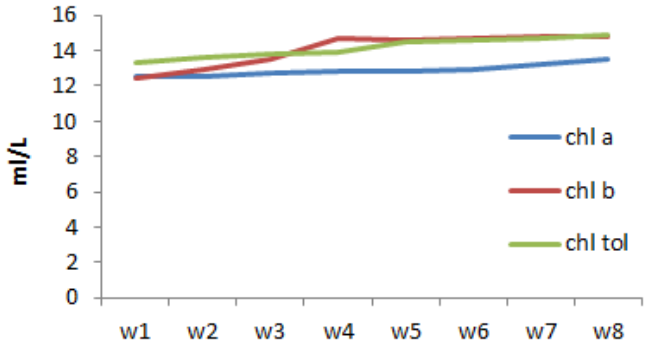


Figure 8. Chlorophyll Content

Increasing chlorophyll content is detected in the data analysis, and there is a significant effect of water supply and fertilizer application

treatments. Farooq et. al. (2009) find the increased chlorophyll content in line with the increase of water supply and fertilizers is due to the increase of the photo oxidation pigment and of development of the chlorophyll. In contrast,it happens in water stress (dosages of less water and less fertilizer), chlorophyll content decreases in water stressful condition due to creation of photo-oxidation pigment, and consequent of the damage in chlorophyll leaves.

In stressful water condition, the formation of chlorophyll must have been decreased, this should make other organs disturb and may be experiencing the degradation of chlorophyll. Cornoy et. Al. (1988) stated that decreased chlorophyll was due to the chloroplast decomposition and deleting of tylacoid structure. The curves in Figure 8 show there will be a possible development or increased chlorophyll in further growth (in the second generation plant).Chlorophyll is the most important tissue, it represents as autotroph organism meaning self-producing energy. The "vegetation Creator" has provided leaf with green in color *as-syajar al-akhdlar*. After being prepared the *Nāru* in the vast meaning is the energy (glucose main product and oxygen by product of photosynthesis). It stated in the Holy Qur'an: Yasin, [36]: 80. He is the excellent and brilliant creator who create it from toxic gas (CO_2) and produce beneficial and vital substances (oxygen and sugar) . Praises and thanks to Allah, the Creator. So, chlorophyll content is an important indicator of well growing plant.

1) Stem Diameter

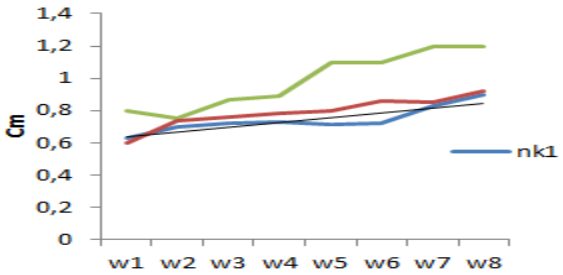


Figure 9. Stem Diameter

Plant growth curves in Figure 9 showing the increasedof the stem circle. The stem diameter were affected by all dosages of water treatment differ significantly. This happened because the water and fertilizer did effectively in this first generation of plants which was mostly affected by environmental conditions. Stem diameters were firstly much affected by the potential of rhizome cuttings which became the base of the first stem growth. Rhizome cuttings were selected that the length and diameter of rhizome cuttings was

relatively the same. Homogeneous conditions created by this, it is the first ramie stem generation. Magnitude girth growth of stem at the beginning is determined by the size of the growing point or bud of seedlings. And, the bud has relatively the same size. Generated and enhanced by addition supply of water and nitrogen and potassium apllicationwould be making good condition of nutrition and water for growing. The curves show the more water and fertilizer the bigger diameter of stem. And, the lesser water and fertilizer the smaller the diameter is. Herdina et. Al. (1990) said lack of water caused dehydration of chloroplast and other organelles of the the protoplasm. These disturbed photosynthesis mechanism.

2) Stem Length

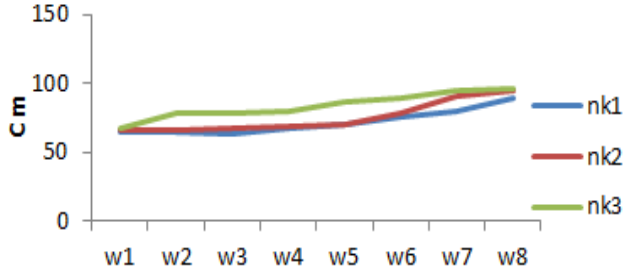


Figure 10. Length of Stem

Effect of water dosages on stem length showedthe difference significantly. Indeed, the most high-dose treatment (H) and also G is at the peak of the stem length. Although the conclusionis the provision of water in all levels G and H or above 75% of field capacity causing most positive influence on the upwards growth or stem length. Edward (1981) said that potassium enhance root to penetrate deeper into the lower part of soil horizon enabling reach the wetter part of dryer soil. More water could be extracted. While in the poly bag plant, it means potash could initiate growth of roots, and better root would absorb more nutrients for the growth and development of stem.

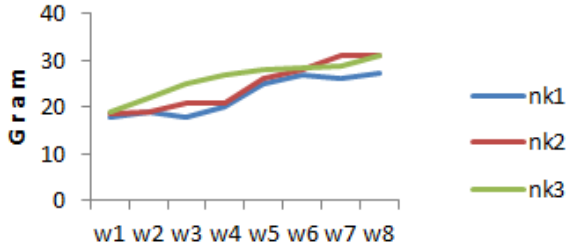


Figure 11. Weight of Stem

3) Stem Weight

The weight of stem represents the weight of the plant organism which is the total weight of the plant cell as constituent of plant organs. Figure 11 shows a good increase of weight and result of analysis of variance showed differ significantly a higher dosages of water and fertilizer applied the heavier stem. It means less water and fertilizer indicated stagnant growth as showed in treatment of W1, W2, and W3 of all the levels of fertilizer. Newmann (1988) stated capability of the leaves surface to absorb nutrition and CO_2 depended on potash available in the soil. Zhiping (1989) said potash is required to develop and accelerate the growth because it affect to the growth of roots.

4) Crude Fiber Weight

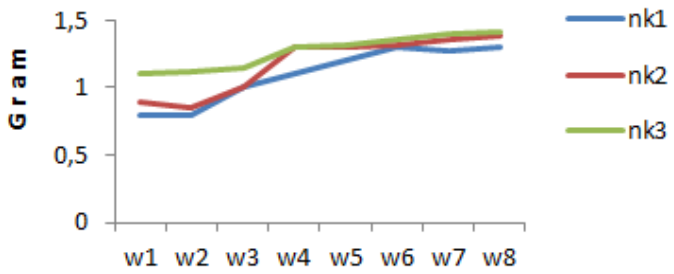


Figure 12. Weigh of Crude Fibre

The weight of crude fiber is obtained through the process of cleaning or separating the stem which is not fiber and fiber content. Part of stem that is not fiber is of parenchyma tissue and collenchym, while the fiber is schelenchym tissues. The results of statistical analysis showed a similar pattern to the results of statistical analysis on the weight of the stem. It means the removal of non-fibre substances is in proportional. Esau (1984) said that ramie fiber is extraxiler that is fibre existing outside the xylem tissue. And Fahn (1992) said that ramie fiber developed in secondary phloem tissue. Curves of Figure 12 show the increase of fibre in line with the increase of water supply and application of fertilizer. Balittas (2014) stated that the fiber production of Ramindo 1 (formerly the Pujon 10 cultivar) per stem is 4-5 gram, while the experiment showed at the dosages W1 and W2 at all levels of fertilizer produced below the 1.5 gram. It means the pressure of water made plant difficult to develop its tissue.

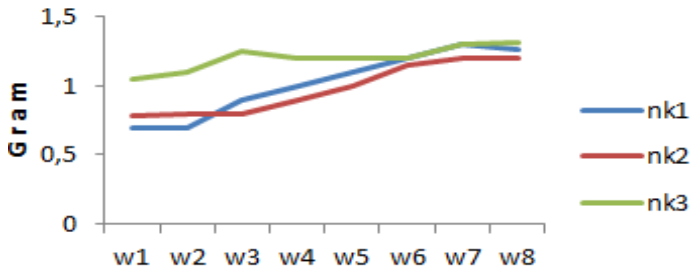


Figure 13. Weight of Fine Fibre

5) Fine fibers Weight

Fine fibers Weight are fibers that have been cleaned through degumming process. Non fiber content is a group of compounds likes slime (gum). This gumremoval process called degumming using an alkaline solution after cleaning fiber out of gum. Thus, the results of a further statistics test show the same result. It is logically proportional to the weight of the stem and the weight of crude fiber, and of fine fibers which are obtained. Plants were difficult to differentiate its tissue in the water stressful condition. Fiber yield was below the standard production. Kuan et.al (1989) said to increase the ratio of fibre to the stem weight was required the management of fertilizer and watering.

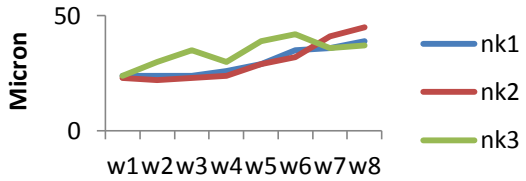


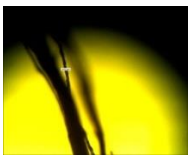
Figure 14. Diameter of Fine Fibre

Diameter of fine fibre shows the pattern of erratic increase in line with the increase of fertilizer application and water supply. The more fertilizer apply and the more water supply the bigger diameters are. Dimension of ramie fiber may be between 13 μ up to 126 μ and the mostly found between 40 μ to 60 μ (Ditjenbun,1997). Diameter represents the fineness of fibre or quality, the smaller the diameter the finer the fibre is. Finer fibre is wanted by the producer of textile. Subandi (2002) found ramie planted in dryer region would have finer fiber. Plant suffered with lack of water limited in developing its tissues.

Ramie grows in more fertile soil with sufficient water to develop its tissues normally, and more fertile soil and more water available would affect

plant to grow rigorously and develop good vegetative organs with bigger cells and tissues. Fiber is vegetative tissue, so supplying more water and fertilizer yield worse dimension of fiber in respect of quality. The human effort to manage micro processing is very possible. Micro and even nanotechnology are developing by human. This capacity of human to manage tiny substances is as the given of God. Information that all tiny substances are controlled by God included in QS. Yunus, [10]: 61 as quoted by Subandi (2012:2). All these should make educated peopletobelieve more in God, Allah the Best Creator, and ultimately Muslims are obliged tobe more *Tauhīd*.


15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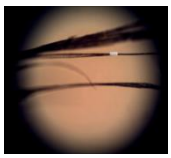
18

Figures 15, 16, 17, and 18 are samples of diameter of fine fiber. Fine fiber measured with Optilab equipped to Binocular Microscope.
Measurement is executed with program of Window 7. (Sample 15=24 μ; 16 = 24 μ; 17 = 24 μ; and 18 = 49.0 μ)

Twenty days after planting.

Plot C (W3=35%-40% PC);
Plot E (W5=55%-60% PC);
Plot G (W7=75%-80% FC)
PC= Field capacity (water)

Twenty days after planting ramie, plant was treated with water and Nitrogen+ Potash dosages. Dosages showed sufficient growth (35%-40% PC), upper the capacity means luxury consumption. The ultimate purpose of growing ramie is to produce fiber for preparing clothes. The data above

showed there were minimum dosages of both water and fertilizer at which ramie plant could survive and maintained yielding. These dosages should be the minimum input or the most efficient cost. In the climate change condition where water is difficult to obtain farmers may make better planning for efficient activities in agriculture.

Ramie plant is perennial. Ramie roots system establishes for years in land. It can serve as erosion guardian, water may infiltrate better and stay in soil longer. Root system of vegetation is functioned as water reservoir. Ramie has hydrologic effect preserve water and soil from erosion.

Ramie biomass is rich in nutrient more than other biomass, Balittas (2014) released it research finding. Ramie biomass contains 10 % water, 1.75% lysine, 0.73% methyonine. 0.31% thriphtopan, carotin/provitamin A 13.3 mg, vitamin b 0.74 mg per 100 g of biomass. This composition is luxury feeding for livestock. This simple finding is to contribute to the knowledge of managing climate change, and in turn would contribute to the addition contents of syllabic or curricula of science education.

There is no doubt that conservation of this vital element is fundamental to the preservation and continuation of life in its various forms, plant, animal, and human. It is also obligatory, for, in Islamic law, whatever is indispensable to fulfill the imperative obligation of preserving life is therefore itself obligatory. Any action that obstructs or impairs the biological and social functions of this element, whether by destroying it or by polluting it with any substance that would make it an unsuitable environment for living things or otherwise impair its function as the basis of life; any such action necessarily leads to the impairment or ruin of life itself and the juristic principle is, "What leads to the prohibited is itself prohibited." Owing to the importance of water as the basis of life, God has made its use the common right of all living beings and all human beings. All are entitled to use it without monopoly, usurpation, despoilment, wastage, or abuse. God commanded with regard to the people of Thamud and their camel,"And tell them that the water shall be shared between them…"QS. Al-Qamar, [54]: 28 (Al-Hilali & Muhsin Khan, 1404 H).

CONCLUSION

Islamic education shares with national education goals. One of the goals is mastering science and technology. Islamic education must have diverse subjects if Moslims want to regain another golden age. Islamic education should recollect all had done by Muslim scholars ofthe classical age. They included science and technology as the core curriculum ofinseparatable subjectsof studying Islam. Thus, studying climate change and global warming and their effectstoworld creatures (human, animal, vegetation, and nature)

becomea part of studying the universe. Muslims are encouraged to explore the universe, and obliged to find the solution of how to manage them well. Climate change and global warming have considerable effects on natures, especially on local weather, such as the changing of dry and wet season periods. This research reveals that the dry and rainy season are shifting. The classification of regional rainfall types has been not accurate and valid any more. This will contribute to the alteration of the contents of syllabic or curricula of scientific education in climatology for biology and agronomy, and other subject matter related to atmospheric condition as hydrology and pattern of agonomy or animal behaviour (Etology). Climate change has been observed to have changed the regional and local climates inclusively during the study at the experimental site. It was recorded in the local temperature and air relative humidity. The change of regional climate made the Schmidts and Ferguson classification of regional rainfall types has to be renewed. And, this change will affect to the change ofa subject matter in climatology and environmental education. 1) There is a very efficient dosage of water C (w3=35%-40% Field Capacity) that affectto sufficient growth of plants. The minimum dosage at which plant can survive to produce yield is represented by the most efficient input of production. Water supply for ramie plant could be designed to the most efficient volume to maintain the need of metabolism; 2) Nitrogen and potassium are significantly supportive to the growth of plant in the limited volume of water supply; 3) Ramie is plant a multipurpose plant, almost all of its organs are beneficial for human or animals and the nature.

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