

Lombok-Indonesia. December, 1<sup>th</sup>-2<sup>nd</sup> 2016

# ICST 2016

The 1<sup>st</sup> International Conference on  
Science and Technology  
(Revised Edition-1)



**PROCEEDINGS**

“ Emerging Innovation on Science and Technology for Sustainable Development ”

Supported by



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**Proceedings**

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## KEYNOTE SPEAKERS

<b>Keynote Speaker</b>	<b>Name and Institution</b>	<b>Country</b>
Keynote Speaker 1	<b>Prof. Dr. Akihiro Hazama, MD</b> , Fukushima Medical University	<b>Japan</b>
Keynote Speaker 2	<b>Prof. Dr. dr. Mulyanto</b> , University of Mataram	<b>Indonesia</b>
Keynote Speaker 3	<b>Prof. Hyun Jin Park</b> , Korea University	<b>South Korea</b>
Keynote Speaker 4	<b>Prof. Dr. Anil Kumar A</b> , Asian Institute of Technology, Bangkok	<b>Thailand</b>
Keynote Speaker 5	<b>Prof. Yudi Pranoto</b> , Gadjah Mada University	<b>Indonesia</b>
Keynote Speaker 6	<b>Prof. Amin Ismail</b> , University Putra Malaysia,	<b>Malaysia</b>
Keynote Speaker 7	<b>Prof. Dr. Ing. Mitra Djamal</b> , Bandung Institute of Technology	<b>Indonesia</b>

**THE 1<sup>ST</sup> INTERNATIONAL CONFERENCE ON SCIENCE AND TECHNOLOGY  
(THE 1<sup>ST</sup> ICST UNIVERSITY OF MATARAM  
Mataram, Indonesia, November 30<sup>th</sup> to Desember 3<sup>rd</sup>, 2016**

TIME	AGENDA			MODERATOR			PIC		
Day 1 : Wednesday, November 30 <sup>th</sup> , 2016									
16.00-18.00	Registration ICST Secretariat, JL. Majapahit 62A Mataram						Organizing Committee		
END OF DAY 1									
Day 2 : Thursday, December 1 <sup>th</sup> , 2016									
08.00-09.00	Registration University of Mataram Dome (Prof Sunarpi Building) JL. Majapahit 62A Mataram						Organizing Committee		
09.00-10.00	OPENING CEREMONY Location: University of Mataram Dome (Prof Sunarpi Building) JL. Majapahit 62A Mataram						Drh. Made Sriasih, M.Agr.Sc., Ph.D(MC)		
09.00-09.05	Do'a								
09.05-09.10	Indonesia Anthem			Chair: Laily Mardiana,S.SI., M.Si					
09.05-09.10	Welcome Speech			The Chairman of 1 <sup>st</sup> ICST Dr. Ir. Satrijo Saloko., M.Si					
09.35-10.00	Morning Break Poster Session						Organizing Committee		
10.00-11.15	Keynote Speaker Presentation 1 Location: University of Mataram Dome			Moderator: Prof.Surya Hadi, Ph.D			Notulen: Dr. Rahadi Wirawan		
10.00-10.35	<b>Keynote Speaker-1</b> Health			<b>Prof. Dr. Akihiro Hazama, MD</b> Fukushima Medical University, <b>Japan</b>					
10.35-11.15	<b>Keynote Speaker-2</b> Distribution Of Hepatitis B Virus Genotypes in Indonesia: Implication For Infection Control Measures			<b>Prof. Dr. dr. Mulyanto</b> , University of Mataram, <b>Indonesia</b>					
11.15-11.20	GAP								
11.20-13.05	Keynote Speaker Presentation 2 Location: University of Mataram Dome			Moderator: Prof.Ir.Sri Widyastuti,M.App.Sc.,Ph.D			Notulen: Dr.Satrijo Saloko		
11.20-11.55	<b>Keynote Speaker-3</b> Bioscience and Functional Foods			<b>Prof. Hyun Jin Park, Korea University</b>					
11.55-12.30	<b>Keynote Speaker-4</b> Nanotechnology			<b>Prof. Dr. Anil Kumar A, AIT Thailand</b>					
12.30-13.05	<b>Keynote Speaker-5</b> Biopolymer			<b>Prof. Yudi Pranoto</b> , Gadjah Mada University, <b>Indonesia</b>					
13.05-14.00	<b>Break Poster Session</b>								
14.00-16.15	Parallel Session Faculty of Food Technology and Agroindustry, University of Mataram JL. Majapahit 62 Mataram Room 1 to Room 8, Level 3								
14.00-15.00	Room 1 SCIENCE Moderator: Dr.Rahadi W Notulen: Aluh N	Room 2 HEALTH Moderator: Dr. Yunita Sabrina,Ph.D Notulen: Nanda	Room 3 FOOD SCIENCE Moderator Dr. Satrijo S Notulen: Dewi	Room 3 FOOD SCIENCE Moderator: Dr. Bambang HK  Notulen : Mursal	Room 5 ANIMAL SCIENCE Moderator: M.Sriasih, Ph.D Notulen:Guyub	Room 6 ENGINEERIN G Moderator: Akmalludin, ST.,Ph.D Notulen:Lili	Room 7 SOCIAL HUMANIORA Moderator: Kamaludin Yusra,Ph.D Notulen:Irfan	Room 8 SCIENCE(MIX) Moderator: Sulaiman ND.,Ph.D Notulen:Nunik	
14.00	003_Lisa F	007_Taufik H	005_Endrika	008_DesiA	025_Hariadi	012_Salman	001_Kurroti	035_Yuliana A	
14.10	009_Rudy S	017_Sudarma	116_Zainuri	023_Nurul H	029_Mujahid I	013_Yudi P	002_Hikmawati	127_Rumiyati	
14.20	010_Dego YA	018_Elok	028_Nur Ida	041_Ernaway	031_Nurul H	021_Fatmawati	011_Ronnie SN	033_Hera Sisca	
14.30	024_Jhauratul	020_Rosalina	037_Nur Isti	054_Titin S	104_Nalle C	055_Aris D	014_Nera FR	070_Aliefman	
14.40	121_Dhony H	027_Rika HS	049_Nida EH	066_Taslim S	117_Sapriani	056_Susilawati	016_anggi	134_Murgayanti	
14.50	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	
15.00	GAP								
15.05-16.05	Room 1 SCIENCE Moderator: Dr. Rahadi W Notulen: Nunik	Room 2 HEALTH Moderator: Made Sriasih,Ph.D Notulen: Nanda	Room 3 SCIENCE (MIX) Moderator: Dr. Satrijo Saloko Notulen: Aluh	Room 6 ENGINEERING Moderator: Akmalludin, ST., Ph.D Notulen:Dewi	Room 7 SOCIAL HUMANIORA Moderator: Kamaludin Yusra, Ph.D Notulen: Guyub	Room 8 ENGINEERING Moderator: Sulaiman ND, Ph.D Notulen:Laili			
15.05	040_Siti Alaa	067_LR Telly S	130_Bambang HK	057_Suhayat	058_Rosalina	021_Fatmawati Amir			
15.15	043_Dhony H	074_Nurul F	114_Rauhul K	065_Husniatul K	073_IK Budastra	026_Made Sutha Y			

15.25	071_Aris D	080_Adriana E	133_Sukmawaty	069_Rahadi W	075_IGAK Chatur	128_Nurul F
15.35	072_Desi K	085_Yunita S	163_Indriyatno	125_Ramkani K	076_Tajidan	131_Nursiah C
15.45	132_Kansawi	093_Antari Al	032_Nurul H	126_Ramkani K	129_Muktasam	163_Buan Ansari
15.55	135_Budy Wiryono		112_W.Wangiana			166_IW Sudiarta
16.05	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION
16.15-16.45	Afternoon Tea					
END OF DAY 2						

Day 3 : Friday, December 2 <sup>nd</sup> 2016								
08.00-09.00	Registration University of Mataram Dome (Prof Sunarpi Building) JL. Majapahit 62A Mataram				Organizing Committee			
08.00-09.30	Keynote Speaker Presentation 3			Moderator: Prof. I Komang Damar Jaya		Notulen: Dr. Aluh Nikmatullah		
08.00-08.45	<b>Keynote Speaker-6</b> Functional and Halal Food			<b>Prof. Amin Ismail</b> University Putra Malaysia, <b>Malaysia</b>				
08.45-09.30	<b>Keynote Speaker-7</b>			<b>Prof. Dr.Ing. Mitra Djamal</b> , Bandung Institute of Technology, <b>Indonesia</b>				
09.30-10.00	Morning break Poster Session							
10.00-11.00	Parallel Session Prof. Sunarpi Scientific Lecture Hall University of Mataram Jalan Majapahit 62 Mataram Dome Level 1(Room 1); Level 2 (Room 2 to 8)							
10.00-11.00	Room 1 SCIENCE Moderator: Dr. Rahadii W Notulen: Aluh	Room 2 HEALTHY Moderator: Dr. Yunita Sabrina, Ph.D Notulen : Nanda	Room 3 AGRICULTURE Moderator: Dr. Satrijo S Notulen:Dewi	Room 4 AGRICULTURE Moderator: Dr.Bambang HK Notulen: Mursal	Room 5 SCIENCE Moderator: M. Sriasih, Ph.D Notulen: Guyub	Room 6 ENGINEERING Moderator: Akmaluddin,ST., Ph.D Notulen: Laili	Room 7 SOCIAL Moderator: Kamaludin Yusra., Ph.D Notulen: Irfan	Room 8 SCIENCE(MIX) Moderator: Sulaiman ND, Ph.D Notulen : Nunik
10.00	044_Dhony H	039_Ida Ayu EW	077_Sri Tejo W	105_Asep P	019-Nurul I	059_Aris D	022_Haryadi	045_Dian WK
10.10	124_Handa M	046_Made Darawati	081_Lolita ES	106_Liana S	050_Mala H	060_mustika	034_Sugeng H	078_Leli K
10.20	095_Merry W	047_Hamsu K	083_IKD Jaya	110_M Sarjan	053_Syamsul H	061_Syifa A	038_Dika S	115_B Azizah H
10.30	113_Laili M	048_Dian PS	084_IM Sudantha	111_Nihla F	068_Agustin	063_L Syamsul	042_Irmayani N	118_Ismail Y
10.40	030_Pispitahati	123_Chandra DH	089_IGM Kusnarta	112_W Wangiana	088_Aisah J	064_Annisa F	051_Saprizal H	082_Sri Tejo W
10.50	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION	DISCUSSION
11.00	GAP							
11.10-11.40	CLOSING CEREMONY Location University of Mataram Dome (Prof Sunarpi Building),JL. Majapahit 62A Mataram				<b>Ir. Aluh Nikmatullah, M.Agr.Sc., Ph.D. MC</b>			
11.10-11.20	Presentation the Best Oral and Poster				Organizing Committee			
11.20-11.30	Conference Summary				The Chair 1 <sup>st</sup> ICST Dr. Ir. Satrijo Saloko., M.Si			
11.30-11.40	Closing Speech				Rector University of Mataram			
END OF DAY 3								
Day 4: December 3 <sup>rd</sup> , 2016								
08.00-18.00	FIELD TRIP							
END OF 1 <sup>st</sup> ICST								

## **PREFACE**

Bismillaahirrahmaanirrahiim  
Assalaamu'alaikum warahmatullaahi wabarakaatuh.

Praise always we pray to God Almighty for giving us the abundance of grace, guidance and inayah, so that we all can met in the “1<sup>st</sup>International Conference on Science and Technology (ICST) 2016”. ICST is a conference where researchers can share and publish their scientific papers about science and technology. The theme of this conference is “Emerging Innovation on Science and Technology for Sustainable Development”.

This conference was done for two days, from 1<sup>st</sup> to 2<sup>nd</sup> December 2016, and took place in the Green Campus of the University of Mataram.

We received more than one hundred papers from various universities and research institutions in Indonesia and from overseas, but not all of the papers were published in this proceeding. The paper has been selected and grouped based on the similarity of the research field, which then are presented and discussed. Presentation of the papers will be held in eight parallel classes.

At this moment, the organizing committee would like to expressour gratitude to all of you who have participated this conference, especially to the all keynote speakers, presenters who have submitted posters or orally presented papers and also to the participants. Our special gratitude also goes to the Rector of the University of Mataram who has been highly supporting this conference. Last but not least, the organizing committee would like to thank to all of you who have supported this conference.

Wassalamu'alaikum warohmatullahi wabarakatuh.

Chairman of 1<sup>st</sup> ICST 2016

Dr. Satrijo Saloko

The 1<sup>st</sup> International Conference on Sciences and Technology  
*December, 1-2, 2016 Mataram, Lombok-NTB, Indonesia*

## **OPENING SPEECH - RECTOR THE UNIVERSITY OF MATARAM The 1<sup>st</sup> International Conference on Science and Technology 2016**

Respected Guests,  
Keynote speakers,  
Conference participants,  
and all other participants.

On Behalf of all staffs of the University of Mataram, I welcome you all to Lombok, a beautiful island in West Nusa Tenggara Province, where the University of Mataram is located. Lombok is known for its natural and cultural diversity where you can enjoy traditional cuisines, beaches, waterfalls, mountain, traditional villages and handicraft of many ethnics including Sasak, Samawa, Mbojo, Balinese, Chinese, Arabic, and many others.

As the Rector of the University of Mataram, it is a great honour for me to address the opening of “The 1<sup>st</sup> International Conference on Science and Technology” here at the University of Mataram, which will be held from 1<sup>th</sup> to 2<sup>nd</sup> December 2016, with a theme “Emerging Innovation on Science and Technology for Sustainable Development”. The main aim of this seminar is to gather scientist from all over the world to share their ideas, knowledge and experiences and to build network for possible future collaboration.

As we are aware that sharing knowledge and experiences from speakers are extremely valuable in a conference, therefore I would like to express my high appreciation, first, to the keynote speakers from overseas and from Indonesia for their willingness to come to Lombok to share their acknowledged works. Your effort and contribution to this conference are absolutely valuable. Second, my high appreciation also goes to the national speakers and all other participants, including the speakers from University of Mataram and local universities in West Nusa Tenggara Province, your participation in this conference not only will give incredible share of ideas, skills and knowledge that

The 1<sup>st</sup> International Conference on Sciences and Technology

*December, 1-2, 2016 Mataram, Lombok-NTB, Indonesia*

you have, but also will improve the academic environment that we are developing in this university. I hope this conference will be a good forum, not only for communicating and sharing ideas, knowledge and experiences, but also for building networking for future collaboration.

I would also like to take this opportunity to express my appreciation to the sponsors which have given some contribution to this conference. Last but not least, I would like to thank the organizing committee as well as all other supporters and participants, without their effort, commitment and hard work, this conference will not run well.

Finally, I wish you most successful conference, enjoy Lombok Island and hope to see you again in other forum here at the University of Mataram.

Rector of the University of Mataram

**Prof. Ir. Sunarpi, Ph.D**



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## **Agro-tourism in North Lombok Stimulates New Crops and Technology Adaptation, and Farming Becomes Profitable**

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### **Abstract**

North Lombok Regency is currently implementing economic development, including the development of tourism and agriculture. The regency identifies potential locations, followed by implementation of integrated activities in the frame of agro-tourism. The region supplies water through piping and applies appropriate technology to crops that are introduced to the new cropping land. The results indicate that the introduced crops adapt to the new sites, grow well, and bring profit to farmers. The impact of the development of agro-tourism is positive.

**Keywords:** *Agro-tourism, Appropriate technology, Crop introduction, Farm Profit*

### **1. Introduction**

North Lombok Regency (NLR) has been implementing many policies and programs for developing its region in many aspects. In economic aspect, the regency has top priorities in developing agricultural and tourism sectors, since the region has the potential on these sectors. This direction of development is in line with the national government policies and programs, that are guided in *MP3EI (Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia, The Plan for acceleration and expansion of economic development in Indonesia)*. West Nusa Tenggara (WNT), where North Lombok is within (BPS NTB, 2016), is included in the corridor of Bali and Nusa Tenggara, with one of the focuses is on tourism (Presiden RI, 2011).

NLR has more than 80 % dry land (BPS Lombok Utara, 2014), and thus the availability of water is critical. Several years ago, ground water wells have been built in many spots in NLR to activate agricultural practices, for being sources of the community income. Since then community have been growing many commodities of agriculture in broad sense, including those of estate crops, food crops, and horticulture. Apart from growing old types of crops, new crops are also introduced to region by agricultural producers, by adapting to the local condition or by manipulating the local conditions to enable crop growing, and by not forgetting economic consideration.

In achieving the goals of tourism, economic, and agriculture for the well being of the people, NLR develops the so called 'agricultural tourism', 'agri-tourism', 'agro-tourism' ('agro-wisata'). Essentially, this type of tourism is developing agriculture for the purpose of providing agricultural beauty for visitors to enjoy. This type of business has been increasing in recent years in Indonesia and other parts of the world. The entrepreneurs of this business maximize profit by exploiting revenue from the crops grown and also from tourism aspect of the activity (Wikipedia, 2016).

In integrating agriculture into tourism, supporting systems need to be included, among others, are suitable irrigation facilities and profiting new crops. Irrigation is required for enabling optimal application of agricultural inputs, particularly seeds and fertilizers. In addition, agricultural producers search for new crops that grow well in the location as well as

have a good price, all of which accumulate to become better profit than ordinary grown crops. This paper describes the impacts of agro-tourism developed in Gumantar Village, Kayangan District, North Lombok Regency

## **2. Materials and Methods**

This study combined quantitative method (Neuman, 1997; Taylor, 2000) and qualitative methods (Neuman, 1997; Patton, 2002; Trumbull, 2000), to provide figures and explanation as needed. This research took place in Gumantar Village, Kayangan District, North Lombok Regency, and was designed to develop tourism with beauty of agriculture that attracts people to visit. The location for crop growing and crops to be grown on the location were discussed by team members. In this early stage of tourism are development, two crops were chosen, i.e. tomato and rock melon. In addition to their beauties, these two crops were considered promising to give good earnings. Furthermore, the location considered suitable for the crops and provides a good view, is asked for agreement from a farmer (farmers). After the farmer agreed to grow the crops, then the farmer is given instruction on how to grow the crops, including how much each input to be applied. He was also asked to record all farm needs and applications, farm production, product price. In particular, investigation team asked the farmer to record application dates and its cost or revenue. The team then copied the record and asked explanations for things considered necessary. These data are complemented with data from secondary sources (Sjah, 2011). Data were analyzed in descriptive way, providing information and understandings (Patton, 2002).

## **3. Results and Discussions**

### **3.1. Managing resources**

This activity is designed for agri-tourism to gain beautifulness or attractiveness and economic profit from crops grown, and others related. The location was selected for the ease of access by travelers, hence road side was chosen. Similarly, water is brought to the location from a source through piping and storage system. The location was (and will be) managed in such way that brings attractiveness and resource use efficiency. Attractiveness invites people to visit, and efficiency in resource use minimize cost. In particular, attractiveness in agricultural products encourages people to buy. All of these are expected to generate profit, one of the main motive in people, including farmers, to behave in certain way.

### **3.2. Water leads the way to agricultural practice**

The traditional practice of agriculture in the area was that mainly to grow corn in most of the land in rainy season. Outside the rainy season, growing crops was inhibited by lack of water for irrigation. Irrigation facility has been introduced to bring water to the area. There are two sources of water for irrigation: springs and ground water. Water from springs is channeled through pipe using gravity. Ground water is brought to the location through pumping system. In addition, water is naturally available during rainy season from rainfalls, although it is limited to the rainy season only.

Since the irrigation water available for the whole year round, farmers have flexibility in growing crops. From one time planting in a year, farmers can now grow crops as they wish during the year. Apart from growing corn, farmers can grow other food crops, vegetables, fruits, or else. In brief, farmers can grow old traditional crops like corn, vegetables, or grow completely new crops.

### **3.3. New crops introduced**

In this beginning period of the development of agro-tourism are, two crops were

introduced. They are tomato and rock melon. The initial planting of tomato was 7 ‘are’ (This is Indonesia term commonly used to measure land, which 1 are = 10 m times 10 m, or 100 m<sup>2</sup>), while rock melon was 6 ‘are’. As these crops can be said as new crops to the farmers, then the implementing team trains and supervises the growing of the groups to guarantee that the crops will grow well. The team also provides inputs, such as seeds, fertilizers, and pesticides. The work of land processing was also done under supervision of the team. In short, the research team controlled.

### 3.4. Income from new crops

The two new crops generated the highest farm income according the record attained. Following conversion to hectare (ha) the income obtained from tomato was as much as IDR 233,750,000 and from rock melon was as much as IDR 137,500,000 (Zainuri *et al.* 2016). These incomes were much higher than income from other crops grown in the Province of West Nusa Tenggara, and possibly in Indonesia too. As comparison, incomes from crops grown in Lombok are presented in Table 1.

**Table 1. Comparison of incomes from several crops in West Nusa Tenggara Province**

Crop	Location	Income per ha (IDR)	Source of information
Tomato	Gumantar	233.750.000	Zainuri <i>et al.</i> (2016)
Rock Melon	Gumantar	137.500.000	Zainuri <i>at al.</i> (2016)
Rock Melon	Central Lombok	109.000.000	Mujianingsih <i>et al.</i> (2015)
Water Melon	Central Lombok	105.000.000	Mujianingsih <i>et al.</i> (2015)
Chili	Mataram	93.000.000	Alis (2016)
Rice	Central Lombok	24.843.954	Wijaya (2016)
Corn	West Lombok	19.752.626	Laksemi (2016)
Rice	West Sumbawa	13.179.046	Ardiansyah (2016)

There are two main reasons for high income from the two crops. Firstly, they have high price. Both tomato and rock melon were produced outside their normal season, when other farmers did not produce. In times of less supply while other factors remained the same, then the price increases (Cramer *et al.*, 2001; McIver, 2001; Penson *et al.*, 2002; Seitz *et al.*, 2002; Sjah, 2010). Secondly, production of the two crops was run in intensive way. Intensification or intensive farming with application of additional inputs is seen as a way to increase agricultural production (Sahidu, 1983; Sari and Sjah, 2016; Savadogo *et al.*, 1998). In particular to these two crop farming, intensification was applied with more organic fertilizers, including manure, granular organic ‘*bioextrim*’ liquid organic (*bomax*, *bioextrim cair*, *hormax*, *bioplant omega*, *hantu*, *super biota plus*), and with more liquid bio pesticides (*biopestisda omega*, *bormax*) (Zainuri *et al.*, 2016). The combination of intensive farming (which lifted productions) and good timing of farming (with increased prices) cause farming of these crops become highly profitable.

## 4. Conclusions and Recommendations

The development of agro-tourism area in Gumantar Village, Kayangan District, North Lombok Regency brings positive impact. The development advances agriculture and tourism as an integration in agro-tourism, which aims of gaining profit through agricultural production and attractiveness. The crops introduced indeed generated among the highest income on record, which was due to high prices and productions of the newly introduced crops. High prices was a consequence of a good production timing, and high productions were contributed



by highly intensive farming. Intensive farming and out of normal season farming was made possible by the availability of water for irrigation. Such program that has proven as having positive impact is recommended to be continued in that location or elsewhere. This program also brought lesson to be learnt that supervision in farming practices is important to ensure high rate of success.

## References

- [1] Alis, W.M.: 2016. *Analisis biaya dan usahatani cabai di Kota Mataram*. Fakultas Pertanian Universitas Mataram, Mataram
- [2] Ardiansyah. 2016. *Analisis komparasi produksi dan pendapatan usahatani padi sebelum dan sesudah adanya Program UPSUS PAJALE di Kecamatan Brang Ene, Kabupaten Sumbawa Barat*. Fakultas Pertanian Universitas Mataram, Mataram.
- [3] BPS Lombok Utara: 2014, *Lombok Utara Dalam Angka 2014 (North Lombok in Figures 2014)*. Badan Pusat Statistik Lombok Utara (Central Body of Statistics of North Lombok), Tanjung.
- [4] BPS NTB: 2016, *Nusa Tenggara Barat Dalam Angka 2015 (West Nusa Tenggara in Figures 2015)*. Badan Pusat Statistik Nusa Tenggara Barat (Central Body of Statistics of West Nusa Tenggara), Mataram.
- [5] Cramer, G. L., Jensen, C. W. and Southgate, D. D. J.: 2001, *Agricultural Economics and Agribusiness*. 8th ed. John Wiley & Sons, New York.
- [6] Laksemi, N.P.: 2016. *Analisis faktor-faktor yang mempengaruhi produksi dan pendapatan usahatani jagung hibrida di Kecamatan Gerung, Kabupaten Lombok Barat*. Fakultas Pertanian Universitas Mataram, Mataram.
- [7] McIver, J.: 2001, *Micro economics*. McGraw-Hill, Roseville, NSW, Australia.
- [8] Mujianingsih, A., Hidayati, A. and Sjah, T.: 2015, 'Analisis Pendapatan dan Penyerapan Tenaga Kerja pada Usahatani Melon dan Semangka di Kabupaten Lombok Tengah (Analysis of income and labor absorption in Rock melon and Water melon farms in Central Lombok).' *Agroteksos* **25**, 131-136.
- [9] Neuman, W. L.: 1997, *Social research methods: Qualitative and quantitative approaches*. Allyn and Bacon, Boston.
- [10] Patton, M. Q.: 2002, *Qualitative research and evaluation methods*. 3 ed. Sage Publications, Thousand Oaks, California.
- [11] Penson, J. B. J., Capps, O. J. and Rosson, C. P. I.: 2002, *Introduction to agricultural economics*. 3rd ed. Prentice Hall, Upper Saddle River, New Jersey.
- [12] Presiden RI: 2011, *Peraturan Presiden Republik Indonesia Nomor 32 Tahun 2011 Tentang Masterplan Percepatan dan Perluasan Pembangunan Ekonomi Indonesia 2011-2025 (Master Plan for Acceleration and Expansion of Indonesia Economic Development 2011-2025)*. Sekretariat Kabinet RI, Jakarta.
- [13] Sahidu, A.: 1983, *Pengantar ilmu pertanian*. Fakultas Pertanian, Universitas Mataram, Mataram.
- [14] Sari, M. and Sjah, T.: 2016, 'Implementation of Special Program of Pajale (Rice, Corn, and Soybean) in Terara District, East Lombok Regency.' *International Research Journal of Management, IT, & Social Sciences (IRJMIS)* **3**, 41-50.
- [15] Savadogo, K., Reardon, T. and Pietola, K.: 1998, 'Adoption of improved land use technologies to increase food security in Burkina Faso: Relating animal traction, productivity, and non-farm income.' *Agricultural Systems* **58**, 441-464.
- [16] Seitz, W. D., Nelson, G. C. and Halcrow, H. G.: 2002, *Economics of resources, agriculture, and food*. 2 ed. McGraw-Hill Series in Agricultural Economics (P. J. Barry, ed.) McGraw-Hill, New York.
- [17] Sjah, T.: 2010, *Ekonomi Pertanian (Agricultural Economics)*. Mataram University Press, Mataram.
- [18] Sjah, T.: 2011, *Metodologi Penelitian Sosial Ekonomi (Research Methodology for Socio Economics)*. Mataram University Press, Mataram.
- [19] Taylor, G. R.: 2000. 'Quantitative research methods', in G. R. Taylor, (ed.), *Integrating quantitative and qualitative methods in research*, University Press of America, Lanham, pp. 69-78.

- [20] Trumbull, M.: 2000. 'Qualitative research methods', in G. R. Taylor, (ed.), Integrating quantitative and qualitative methods in research, University Press of America, Lanham, pp. 79-93.
- [21] Wijaya, A.S.: 2016. Analisis keuntungan dan penyerapan tenaga kerja pada usaha tani padi gogo rancah di Kecamatan Praya Barat, Kabupaten Lombok Tengah. Fakultas Pertanian Universitas Mataram, Mataram.
- [22] Wikipedia: 2016. 'Agritourism', in, Vol. 2016, Wikipedia.
- [23] Zainuri, Sjah, T., Sauqi, A. and Jayaputra: 2016. 'Introduksi Tanaman Baru Di Daerah Agrowisata Desa Gumantar Kecamatan Kayangan Kabupaten Lombok Utara Menguntungkan (New Crop Introduction To Agrotourism Area In Gumantar Village, Kayangan District, North Lombok Regency Is Profitable)', in, Seminar Nasional Pertanian (National Seminar on Agriculture), Faculty of Agriculture University of Mataram, Mataram.